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

SUBJECT: Cervical Spine Evaluation & Clearance Guidelines

AUTHORS: David Bumpass, MD; Kyle Kalkwarf, MD; Benjamin Davis, MD; Carly Eastin, MD

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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 this Guideline require the involvement of the attending physicians.

ABBREVIATION: c-spine: cervical spine; c-collar: cervical collar

INCLUSIONS: Trauma patients presenting to UAMS with spinal injuries *without known or suspected spinal 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 be obtained after the patient has been stabilized hemodynamically and respiratorily. During such stabilization, the cervical spine should be kept immobilized.
2. Penetrating trauma (including to the spine) does not require a c-collar unless accompanied by significant blunt trauma injury to the spine.
3. The field C-spine collar is to be replaced by an Aspen (or equivalent) 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
3. Canadian C-Spine Clearance has the highest sensitivity for determining c-spine injuries and should be used over NEXUS
   a. https://www.mdcalc.com/calc/696/canadian-c-spine-rule

IMAGING:

1. No role for plain films in the initial assessment of cervical spine injuries, because of a low sensitivity.
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 be deferred until the 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 (e.g., report of moving all extremities) 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 interpreted by an attending radiologist AND their neurologic exam is at baseline.

4. If there is a new neurologic deficit localized to the cervical spine, an MRI of the cervical 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 choose to obtain an MRI of the cervical spine or consult a spine specialist. 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 be performed only on alert patients who are either low risk and eligible for clearance without imaging or who 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 perform range-of-motion exercises (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
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injury: a systematic review. Annals of internal medicine. 2015 Mar 17;162(6):429-37.

APPENDIX I:

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

Cervical spine clearance EMR 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's 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.