

Madigan Army Medical Center Clinical Practice Guidelines

Evaluation of the Cervical Spine in the Blunt Trauma Patient

Department of Emergency Medicine
Madigan Army Medical Center
Maintained by Quality Services Division
Clinical Practice and Referral Guidelines Administrator

Last Review for this Guideline: **May 2010**
Clinical Guidelines require review every three years

Core Document

TITLE: Clinical Guideline for the Evaluation of the Cervical Spine in the Blunt Trauma Patient

INDICATIONS FOR THE CLINICAL GUIDELINE: Cervical spine injury is a frequently missed and potentially devastating traumatic injury that demands high standards of care to ensure positive and optimal patient outcomes.

METRICS: THE KEY ELEMENTS OF THE CLINICAL GUIDELINE THAT WILL BE USED TO MONITOR PROVIDER ADHERENCE TO THE CLINICAL GUIDELINE.

We are choosing to monitor trauma patients as an indicator for compliance to the Guideline. Metrics will be collected only for trauma patients because they are at high-risk for cervical spine injury. The data collection piece will be the use of an audit filter for cervical spine. All patients who are characterized as Steps 1, 2 or 3, as well as motor vehicle collisions, motorcycle accidents, pedestrian vs. auto accidents and fall patients will be included. The filter will be chart documentation of proper clearance of the cervical spine before the cervical collar is removed. The three acceptable ways to clear the cervical spine are as follows:

- Clinical clearance
- Plain film radiologic clearance
- Computerized tomography clearance

In addition a second element is the lack of cervical spine tenderness. Chart source to be used includes:

- Essentris Patient History and Physical
- Trauma Resuscitation Flowsheet
- Emergency Care and Treatment Sheet (SF 558), CIS physician's notes for general surgery, orthopedics or neurosurgery

DATE: Published February 2002. Revised April 2010

AUTHORS: Please contact the clinical guidelines administrator at 253-968-3013 for information regarding the authors of this clinical guideline.

AREAS OF DISAGREEMENT: There remains considerable debate in the trauma and orthopedic/neurosurgical community about the benefit (if any) of intravenous steroids for acute spinal cord injury. The recommendation for therapy has been downgraded from a requirement to an option, and should be left to the discretion of the attending spine surgeon and/or trauma surgeon. There was also disagreement about the optimal evaluation and cervical spine clearance method for the obtunded or unexaminable patient with a normal cervical spine CT. There is no level 1 evidence available, and multiple studies have supported removing the collar based on a high quality normal CT scan, performing

routine cervical spine MRI, or performing dynamic flexion/extension imaging. This decision has been left to the discretion of the responsible spine and/or trauma surgeon, but should be thoroughly documented in the electronic medical record.

PUBLISHED GUIDELINES OF CARE AND OTHER REFERENCES UPON WHICH THE CLINICAL GUIDELINE IS BASED:

1. Hoffman JR, Mower WE, Wolfson AB, et al. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. *New England Journal of Medicine* 2000; 343: 94-99.
2. Murphy RB, Humphreys SC, Fisher DL, et al. Imaging of the cervical spine and its role in clinical decision making. *J South Orthop Assoc* 2000; 9:4-35.
3. Bracken MB, Shepard MJ, Collins WF, et al. A randomized controlled trial of methylprednisolone or nalaxone in the treatment of acute spinal injury. *New England Journal of Medicine* 1990; 322:1405-1411.
4. Woodring JH, Lee C. Limitations of cervical radiography in the evaluation of acute cervical trauma. *J Trauma* 1993; 34:32-39.
5. Marion DW, Domeier R, Dunham CM, et al. Practice parameters for identifying cervical spine injuries following trauma. Eastern Association for the Surgery of Trauma Practice Parameter Workgroup for Cervical Spine Clearance, 1998 and year 2000 update, <http://www.east.org/tpg.html>.
6. Roberge RJ, Wears RC, Kelly M, et al. Selective application of cervical spine radiography in alert victims of blunt trauma: a prospective study. *J Trauma* 1988; 28:784-788.
7. Velmahos GC, Theodorou D, Tatevossian R, et al. Radiographic cervical spine evaluation in the alert asymptomatic blunt trauma victim: much ado about nothing? *J Trauma* 1996; 240:768-774.
8. Davis JW, Phreaner DL, Hoyt DB, et al. The etiology of missed cervical spine injuries. *J Trauma* 1993; 34:342-346.
9. Berne JD, Velhamos GC, El-Tawil Q, et al. Value of complete cervical helical computed tomographic scanning in identifying cervical spine injury in the unevaluable blunt trauma patient with multiple injuries: a prospective study. *J Trauma* 1999; 47:896-903.
10. Sanchez B, Waxman K, Jones, T et al. Cervical Spine Clearance in Blunt Trauma: Evaluation of a Computed Tomography-Based Protocol. *Journal of Trauma-Injury Infection & Critical Care*. 59(1):179-183, July 2005.
11. Holmes JF, Akkinapalli, R. Computed Tomography Versus Plain Radiography to Screen for Cervical Spine Injury: A Meta-Analysis. *Journal of Trauma-Injury Infection & Critical Care*. 58(5):902-905, May 2005.

CLINICAL PRACTICE RECOMMENDATIONS:

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Madigan Clinical Practice Guidelines – Evaluation of the Cervical Spine in the Blunt Trauma Patient
(May 2010)

1. Every clinical guideline developed thus far for trauma patients has at least one key point. If not followed this could represent a serious liability to the patient and/or the hospital. The key point(s) will be added to the data collection areas in the Washington State Trauma Registry, Collector. To be eligible for entry into the registry the patient must be a Step 1, 2 or 3 trauma, be admitted to the hospital or observation unit and fall within the ICD-9 codes of 800-904.99 and 910-959.9. Charts meeting the criteria are currently entered into the registry by the Trauma Nurse Coordinator.
2. Purpose: Provide a policy to expedite radiologic and clinical evaluation of the cervical spine for detection of spinous and spinal cord injury, decrease incidence of missed injury, and facilitate early removal of cervical collar.
3. Scope: This policy applies to all acute victims of blunt trauma arriving at Madigan Army Medical Center at risk of cervical injury.
4. Responsibility: It is the responsibility of all physicians and nurses caring for patients at this hospital to adhere to this policy.
5. [Protocol](#).

KEY POINTS:

Initial Diagnosis

- Consider cervical spine injury present on all acute blunt trauma patients.
- Ensure rigid cervical collar is properly in place, physician directed adjustment might be necessary.
- Clinical clearance may be used to clear the c-spine if the patient has all of the following: normal alertness, no intoxication, no distracting injuries, no neck pain, no midline cervical tenderness, no focal neurologic deficit.

Ongoing Diagnosis

- If clinical clearance cannot be made x-rays must include visualization of all spinous processes from C1-T1.
- Adequate visualization of C1-T1 decreases the incidence of missed injury and facilitates early removal of the cervical collar.
- When c-spine clearance cannot be obtained via x-rays and the patient indicates cervical spine tenderness the rigid cervical collar is left in place until the acute injury phase, usually 1-2 weeks, has passed. Alternatively, additional imaging such as MRI or flexion/extension xrays may be obtained.
- Re-evaluation of cervical tenderness should be done by ED, orthopedic or trauma physician.

Emergency Management of Cervical Spine Injury

- Confirmed bony injury with neurological deficit should prompt CONSIDERATION of bolus of Solu-Medrol 30mg/kg IV bolus over 15 minutes then Solu-Medrol IV drip 5.4mg/kg/hr x 24-48 hours. This should be instituted within 8 hours of injury.
- When CT Cervical Spine indicates bony injury consult with orthopedic or neurosurgical spine surgeon immediately.
- When there is neurological deficit without evidence of bony injury consult with orthopedic or neurosurgical spine surgeon immediately.

Madigan Clinical Practice Guidelines – Evaluation of the Cervical Spine in the Blunt Trauma Patient
(May 2010)

- MRI emergently may be considered in the patient with no bony abnormality but neurological deficit after consult with orthopedic or neurosurgical spine surgeon.

IMPACT STATEMENT TO INSTITUTION: Adoption of these clinical guidelines will impact the following departments: Emergency, General Surgery, Orthopedics, Neurosurgery, and Radiology. There is no additional workload or expense involved in the initiation of these guidelines. Adoption of a uniform method of patient care for specific disease processes should increase provider efficiency and positive patient outcomes.

LINKS WITHIN THE MAMC INTRANET: Related Clinical Practice Guideline is the Head Injury which includes reference to the [Glasgow Coma Scale](#).

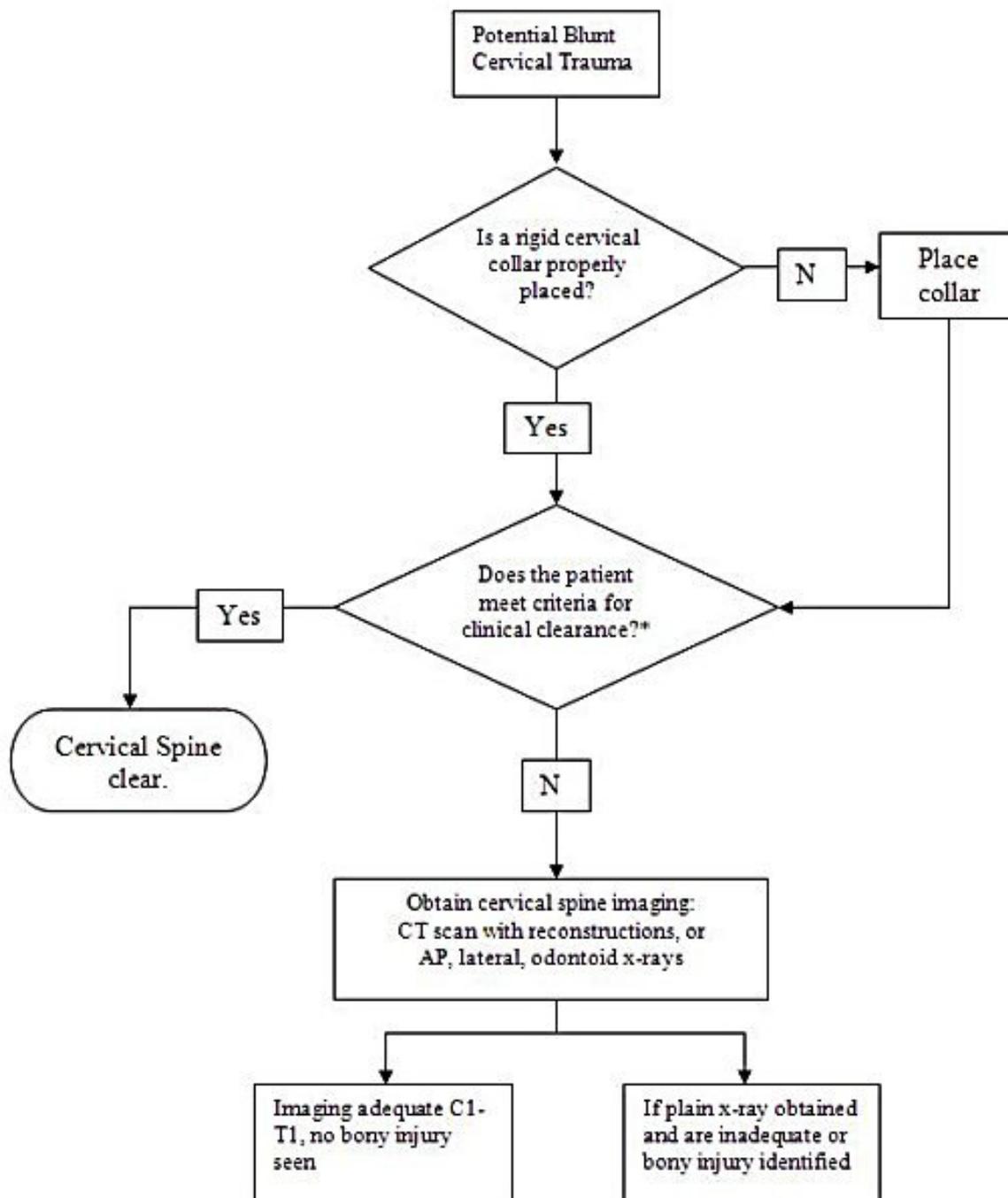
METHODS OF PROVIDER EDUCATION: Regular promulgation of this guideline will be done through didactic lectures at the monthly trauma conference (joint conference for both general surgery and Emergency Medicine departments) on a semi-annual basis.

METHODS OF PATIENT EDUCATION: There are no patient education materials for this clinical guideline.

REVISION FREQUENCY: The clinical guidelines will be reviewed yearly at a Trauma Committee meeting. Current journals relating to emergency medicine, trauma surgery and the recommendation of Committee on Trauma, American College of Surgeons will be monitored for any changes in guidelines of care or treatment modality recommendations. The Trauma Director and the Trauma Nurse Coordinator maintain regular discourse with trauma facilities in the community. Any changes in community guideline of care or treatment will be discussed at the yearly review. Any MAMC research studies that may indicate a need for a clinical guideline revision will be reviewed when results are published or yearly whichever is more timely. Also, any changes mandated by DA or OTSG will be made in a timely manner.

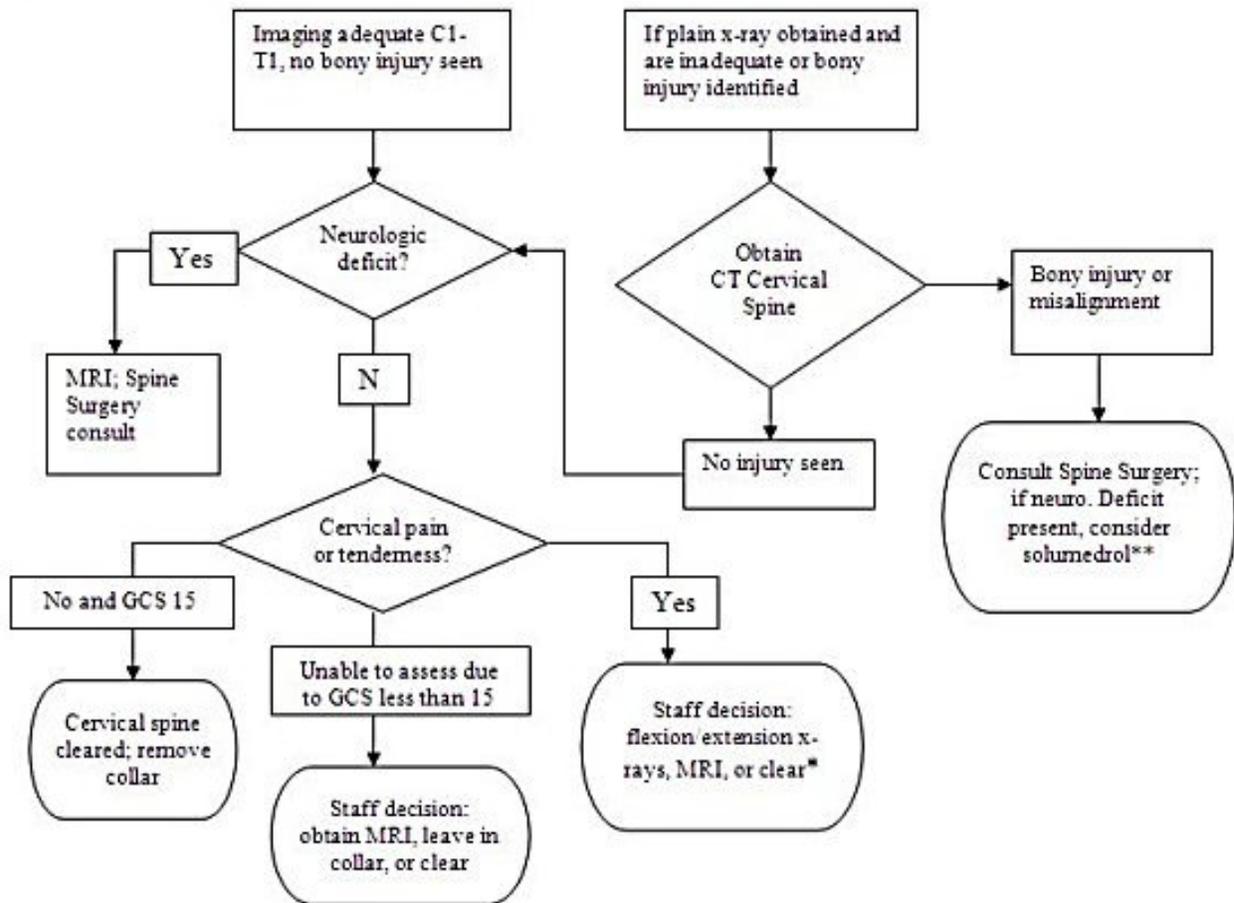
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Madigan Clinical Practice Guidelines – Evaluation of the Cervical Spine in the Blunt Trauma Patient (May 2010)

*Six criteria: normal alertness (GCS 15), no intoxication, no distracting injuries, no neck pain, no midline cervical tenderness, no focal neurologic deficit



**Solumedrol: 30mg/kg IV bolus over 15 minutes, then IV drip 5.4mg/kg/hr x 24 hours (if within 0-3 hours of injury) or 48 hours (if within 3-8 hours of injury). No indication if greater than 8 hours from injury.

GLASGOW COMA SCALE

Eyes Open		Best Verbal Response		Best Motor Response	
Spontaneous	4	Oriented	5	Obeys Commands	6
To sound	3	Confused	4	Localizes Pain	5
To Pain	2	Inappropriate Words	3	Withdrawn (pain)	4
None	1	Incomprehensible Sounds	2	Flexion (pain)	3
		None	1	Extension (pain)	2
				None	1
Total		Total		Total	
GCS Total					

Metrics

THE KEY ELEMENTS OF THE CLINICAL GUIDELINE THAT WILL BE USED TO MONITOR PROVIDER ADHERENCE TO THE CLINICAL GUIDELINE:

1. For patients >12 months of age who have sustained blunt trauma, documentation in the patient record will indicate that a cervical collar remained in place until one of the following was obtained:

- Clinical clearance
- Plain film radiologic clearance
- Computerized tomography clearance

2. The second metric is documentation of the presence or absence of cervical spine tenderness. Chart source to be used includes one of the following:

- Essentris Patient History and Physical
- Trauma Resuscitation Flowsheet

Emergency Care and Treatment Sheet (SF 558), Essentris physician's notes for general surgery, orthopedics or neurosurgery

Key Points

Initial Diagnosis

- Consider cervical spine injury present on all acute blunt trauma patients.
- Ensure rigid cervical collar is properly in place, physician directed adjustment might be necessary.
- Clinical clearance may be used to clear the c-spine if the patient has all of the following: normal alertness, no intoxication, no distracting injuries, no neck pain, no midline cervical tenderness, no focal neurologic deficit.

Ongoing Diagnosis

- If clinical clearance cannot be made x-rays must include visualization of all spinous processes from C1-T1.
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Madigan Clinical Practice Guidelines – Evaluation of the Cervical Spine in the Blunt Trauma Patient
(May 2010)

- When there is neurological deficit without evidence of bony injury consult with orthopedic or neurosurgical spine surgeon immediately.
- MRI emergently may be considered in the patient with no bony abnormality but neurological deficit after consult with orthopedic or neurosurgical spine surgeon.

Provider Tools

Regular promulgation of this guideline will be done through didactic lectures at the monthly trauma conference (joint conference for both general surgery and Emergency Medicine departments) on a semi-annual basis.