Algorithm 1: Evaluable Cervical Spine Injury Patient

Prior to Arrival at Trauma Center

- Resuscitation / ATLS protocol
- Spine stabilization
  - Place semi-rigid C-collar; immobilize entire patient on long spine board with proper padding
  - Maintain C-spine precautions (log roll, elevating HOB via reverse Trendelenburg only)

EVALUABLE PATIENT CRITERIA (must fulfill all criteria)

- Glasgow Coma Scale score ≥ 15
- Not intoxicated
- No distracting injury (preventing patient's full concentration on exam)
- Reliable / cooperative clinical exam

Determine if patient has neurological deficits and/or C-spine bony tenderness (not soft tissue)

No Neurological Deficit Present

No neurological deficit and without C-spine (bone) tenderness / pain

Imaging*

No C-spine imaging required

Follow-Up

Attending physician or experienced resident (trained in Nexus: Neurosurgery, Orthopedics, Trauma):
- Clears the C-spine.
- Documents clearance in medical record.
- Removes C-collar

No neurological deficit but with significant C-spine (bone) tenderness / pain

Imaging*

STAT CT of cervical spine

Follow-Up

Abnormal Results (severe malalignment / fracture)
- If CT abnormal, obtain urgent Spine consult** and obtain CT of TL spine (see Algorithm 1 in TL Spine guideline)

Normal Results (no malalignment / fracture)
- If CT negative and patient’s pain resolves, patient can be clinically cleared
- If CT negative and patient continues to complain of neck pain acceptable approaches include:
  a. Low Suspicion: obtain upright flexion/extension lateral radiographs
  b. High Suspicion: place patient in rigid c-collar and refer for outpatient follow-up with spine center
  c. Obtain non-emergent MRI

Neurological Deficit Present

Neurological deficit referable to spine injury

Imaging**

- STAT CT of cervical spine
- STAT CT of TL spine (can be extracted from concurrent chest, abdomen, and pelvis CT if available)

Follow-Up

- Order STAT Spine Consult
  - Need for MRI to be determined by spine specialist

* Determine if thoracolumbar spine (TL spine) imaging is needed, per Thoracolumbar Spine Guideline.
** Consult Spine team for 3 or more Transverse Process fractures
Algorithm 2: Non-Evaluable Cervical Spine Injury Patient

Prior to Arrival at Trauma Center
- Resuscitation / ATLS protocol
- Spine stabilization
  - Place semi-rigid C-collar: immobilize entire patient on long spine board with proper padding
  - Maintain C-spine precautions (log roll, elevating HOB via reverse Trendelenburg only)

NON-EVALUABLE PATIENT CRITERIA
(any of the following)
- Glasgow Coma Scale <15
- Intoxicated
- Distracting Injury (preventing patient’s full concentration on exam)

Determine if patient has neurological deficits and/or C-spine bony tenderness (not soft tissue)

Imaging*
- STAT CT of cervical spine
- STAT CT of TL spine (can be extracted from concurrent chest, abdomen, and pelvis CT if available)

If any abnormality, obtain Urgent Spine Consult**

Normal imaging studies but not moving extremities
- STAT MRI at suspected level of injury
  - If MRI normal, physician may remove C-collar after documenting patient’s “Cervical spine radiographic clearance” in medical record
  - If MRI abnormal, obtain emergent Spine consult**

Normal imaging studies but with focal neurological deficits consistent with cord and/or nerve root injury
- STAT MRI at suspected level of injury
- STAT Spine consult**

Normal imaging studies and no focal neurological defects
- If patient is likely to become evaluable within 24-48 hours (i.e., intoxicated without neurological injury), continue spine precautions and reevaluate once intoxication resolved, based on either the Evaluable or Non-Evaluable guidelines
  - If MRI normal, physician may remove C-collar after documenting patient’s “Cervical spine radiographic clearance” in medical record
  - If MRI abnormal, obtain Spine consult**

Normal imaging studies and no focal neurological defects
- If patient is unlikely to become evaluable within 24 hours, physician may obtain non-emergent MRI
  - If MRI normal, physician may remove C-collar after documenting patient’s “Cervical spine radiographic clearance” in medical record
  - If MRI abnormal, obtain Spine consult**

* Determine if thoracolumbar spine (TL spine) imaging is needed, per Thoracolumbar Spine Guideline.
** Consult Spine Team for 3 or more Transverse Process fractures
References

- Advanced Trauma Life Support. American College of Surgeons, Committee on Trauma. Presentation on Spine and Spinal Cord Trauma, 2008.
- American Spinal Injury Association (ASIA), Standard Neurological Classification of Spinal Cord Injury. Rev. 03/06.

Quality Measures

- Time to consult
- Time to CT
- Time to MRI
- Time to fixation
- Time to brace

Guideline Authors

- Steve Steinberg, MD
- David Evans, MD
- Thuan Ly, MD
- Danny Eiferman, MD
- Frank Farhadi, MD
- Creagh Boulger, MD
- Scott Eley, RN

Guideline Approved


Disclaimer: Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.

Copyright © 2016. The Ohio State University Wexner Medical Center. All rights reserved. No part of this document may be reproduced, displayed, modified, or distributed in any form without the express written permission of The Ohio State University Wexner Medical Center.