General Guidelines:

These "guidelines" represent a consensus on the management of cervical spine clearance in the acute setting. These guidelines are based on the opinions, clinical experience of multidisciplinary faculty. These guidelines are in no way meant to supersede the clinical judgment of the clinicians managing a particular patient. There is no gold standard when it comes to clearing the cervical spine. In any case there is a small risk for the development of an abnormality in a delayed fashion. Given this, every clinician managing an acute trauma patient should maintain a high index of suspicion for an "occult" injury.

1. Any patient with a known thoracic and/or lumbar fracture should be treated in a hard cervical collar and their cervical spine cleared.
2. The majority of the patients will arrive with a "field" rigid orthosis. If the cervical spine can be cleared in a timely fashion, this collar can be left in place. For the comatose patient, or a patient who will remain intubated and sedated for a prolonged period of time, these "field" collars should be switched to a long term rigid cervical orthosis (Aspen, Philadelphia, Miami J, etc).
3. In order to "clear" a cervical spine one of two things must happen:
   a. The patient must have adequate imaging of the cervical spine which fails to demonstrate an acute bony and/or ligamentous injury.
   b. The patient must be able to cooperate with a bedside examination. During this examination, the patient should not complain of pain to palpation. If the patient is alert, awake, oriented, cooperative, not on pain medications and cleared by a physician using a standard clinical guideline, further radiologic studies are not necessary.

CATEGORY I: If the patient is alert, awake, oriented, cooperative, not on pain medications and states that there is no neck pain nor tenderness on midline palpation and range of motion.

A. C-Spine X-rays may not be necessary as determined by a specialist from: Emergency Medicine, Trauma Surgery, Ortho-Spine or Neurosurgery.
B. Obtain adequate imaging of the cervical spine to include at least one of the following if indicated by standardized clinical guideline:
   1. A spiral CT scan of the cervical spine through T1 at a minimum. This examination must ~~include coronal and sagittal reformats~~
   2. AP, lateral and open mouth odontoid radiographs of the cervical spine. The superior aspect of T1 must be visualized.
   3. 1 and 2 are equivalent for low risk patients.
C. In order to "clear" a cervical spine one of two things must happen:
   a. The patient must have adequate imaging of the cervical which fails to demonstrate an acute bony and/or ligamentous injury.
   b. The patient must be able to cooperate with a bedside examination. During this examination, the patient should not complain of pain to palpation. If the patient is alert, awake, oriented, cooperative, not on pain medications and states that there is no neck pain on palpation and range of motion, further radiologic studies are not necessary. If there is pain on palpation of the cervical spine, please see attached flowsheet for guidelines regarding radiography recommendations.
D. Removal of the Cervical Collar is then warranted.

CATEGORY II: Low Risk Patients.
For patients who are awake, alert and not intoxicated, but complain of neck pain or midline neck tenderness.

Please see attached flowsheet for guidelines regarding radiography recommendations.

A. If indicated by the flow sheet, obtain adequate imaging of the cervical spine to include at least one of the following:
   1. A spiral CT scan of the cervical spine from skull base through T1 at a minimum. This examination must include coronal and sagittal reformats
   2. AP, lateral and open mouth odontoid radiographs of the cervical spine. The superior aspect of T1 must be visualized.
      1 and 2 are equivalent for low risk patients.
B. Any suspicion for ligamentous injury should be followed up immediately with an MRI of the cervical spine.
   - If an MRI is required, it should be performed within 72 hours of injury when possible. After 72 hours non-specific changes may make it difficult to detect a ligamentous injury.
C. Once an injury has been diagnosed the on call spine service (Orthopaedic or Neurosurgery) ~~should be contacted.~~
D. In the absence of a radiographic injury, the cervical spine can be cleared.

CATEGORY III: High Risk Patients.
For patient who are awake, alert, oriented but with multiple traumatic injuries, high clinical suspicion of cervical injury (>5% pre-test probability).

A. A spiral CT scan of the cervical spine through T1 at a minimum. This examination must include coronal and sagittal reformats.
B. Any suspicion for ligamentous injury should be followed up immediately with an MRI of the cervical spine.
   - If an MRI is required, it should be performed within 72 hours of injury when possible. After 72 hours non-specific changes may make it difficult to detect a ligamentous injury.
C. Once an injury has been diagnosed the on call spine service (Orthopaedic or Neurosurgery) should be contacted.
D. In the absence of a radiographic injury, the cervical spine can be cleared. If the patient has persistent pain, and clinical suspicion of ligamentous injury persists despite negative imaging, the collar can remain on at physician's discretion until the patient can participate in a follow up flexion/extension films.

CATEGORY IV: For patients who are comatose and obtunded with normal plain films/CT scans.

All trauma patients with an altered level of consciousness should be assumed to have a cervical spine injury. As such, they should remain in a rigid cervical orthosis until their spines have been cleared.

There are three subcategories:

A. Short term alteration in level of consciousness (e.g., chemically paralyzed/sedated patients, intoxicated patients, patients with minor head injuries, etc)
B. Patients intentionally kept in a sedated state (e.g., patients with pulmonary injuries) & patients with an altered level of consciousness of unknown duration (e.g., diffuse head injury patients, etc)
C. Patients with prolonged alteration in consciousness (e.g., severe head injuries, polytrauma patients, etc) who did not or could not undergo an MRI scan within 72 hours of injury

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LEVEL I TRAUMA CENTER

Cervical Spine Evaluation Guideline for Trauma Patients

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A. Short term alteration in level of consciousness (e.g., chemically paralyzed/sedated patients, intoxicated patients, patients with minor head injuries, etc)

A. Obtain a spiral CT scan of the cervical spine through T1 to include coronal and sagittal reformats.
B. Any ligamentous injury should be followed up immediately with an MRI of the cervical spine.
   - If an MRI is required, it should be performed within 72 hours of injury when possible. After 72 hours non-specific changes may make it difficult to detect a ligamentous injury.
C. Once an injury has been diagnosed the on call spine service (Orthopaedic or Neurosurgery) should be contacted.
D. These patients should remain in a rigid cervical orthosis until they can be cleared radiographically and clinically.
E. If these patients do not return to a normal level of consciousness within 24 hours then they should be treated as in subcategory B.
F. If the patient has normal thoracolumbar films and normal plain films/CT scans of the cervical spine they can be nursed upright in bed and transported in a cervical collar.

B. Patients intentionally kept in a sedated state (e.g., patients with pulmonary injuries) & Patients with an altered level of consciousness of unknown duration (e.g., diffuse head injury patients, etc)

A. Obtain a spiral CT scan of the cervical spine through T1 to include coronal and sagittal reformats.
B. Any suspicion for ligamentous injury should be followed up immediately with an MRI of the cervical spine.
C. If there is a clinical suspicion that a patient will remain sedated/obtunded/comatose for more than 7 days we recommend obtaining an MRI of the cervical spine within 72 hours of injury when possible.
D. Once an injury has been diagnosed the on call spine service (Orthopaedic or Neurosurgery) should be contacted.
E. These patients should remain in a rigid cervical orthosis until they can be cleared radiographically and clinically.
F. If the patient has normal thoracolumbar films and normal plain films/CT scans of the cervical spine they can be nursed upright in bed and transported in a cervical collar.
G. If there is no evidence of a fracture and/or ligamentous injury on plain films/CT and MRI, the cervical spine can be considered “cleared”, although as stated above an occult injury may still be present.
H. In the event that any of the above demonstrates an abnormality the on call spine service (Orthopaedic or Neurosurgery) should be contacted.

C. Patients with prolonged alteration in consciousness (e.g., severe head injuries, polytrauma patients, etc) who did not or could not undergo an MRI scan within 72 hours of injury

A. Obtain a spiral CT scan of the cervical spine through T1 to include coronal and sagittal reformats.
B. If the patient has normal thoracolumbar films and normal plain films/CT scans of the cervical spine they can be nursed upright in bed and transported in a cervical collar.
C. A spine consult should be obtained.
D. The method used to clear the cervical spine is dependent on the consulting attending.
E. Further work-up may include repeat plain films, CT, MRI and/or flexion/extension studies under fluoroscopy.
F. Flexion/extension studies under fluoroscopy are technically challenging examinations and it is our feeling that this should be reserved for cases in which no other option is available.
G. Dynamic testing under fluoroscopy should not be construed as a gold standard test. It is, however, the only test available which approximates flexion/extension studies in the awake patient.
H. This will need to be coordinated with the on call spine team and radiology
I. If fluoroscopy is interpreted as normal, the cervical spine is “cleared”
J. Patients who cannot travel to fluoroscopy should remain in an orthosis until they can comply with a bedside clinical exam or are stable enough to travel to a fluoro suite.

For questions, please contact Trauma Service at (314)362-9175.