GUIDELINES FOR CERVICAL SPINE IMMOBILIZATION AND CLEARANCE

CERVICAL IMMOBILIZATION

OBJECTIVES:
1. To define appropriate methods for cervical spine immobilization prior to clearance.

DEFINITIONS:
1. Cervical spine immobilization: Use of a device to stabilize the neck in a neutral position until adequate evaluation can be undertaken to determine the presence or absence of cervical spine injury.

GUIDELINES:
1. All patients who have mechanism for cervical spine injury and are being evaluated according to the C-spine clearance protocol must be treated with cervical spine immobilization, including:
   a. Log roll if suspicion of cervical, thoracic, lumbar or sacral spine injuries.
   b. Appropriate splinting devices such as cervical immobilization collar, bayshaw and long backboard.
2. Cervical spine clearance should be carried out at the earliest opportunity. Patients remaining on the backboard for extended periods of time will be at increased risk of developing tissue necrosis and pressure sores.
3. Most patients will arrive to the trauma room with a cervical collar in place.
   a. Make sure the collar has been applied correctly.
   b. Check under the collar (with manual immobilization) for the presence of subjective tenderness, lacerations, swelling, penetrating injuries, tracheal deviation, subcutaneous emphysema or distended neck veins.
   c. Make sure that the collar is appropriately padded around lacerations or other open wounds.
4. Proceed with C-spine clearance protocol.
5. If cervical spine injury cannot be ruled out in less than 8 hours, then change the cervical collar to an appropriately sized Aspen or similar collar.

CERVICAL SPINE CLEARANCE

OBJECTIVE:

To provide guidelines for the diagnostic evaluation of the cervical spine in patients suffering multiple injuries who are at high risk for cervical spine injuries.

NOTE: There is no current standard, universally accepted, evidence based protocol for the clearance of the cervical spine. Please refer to www.east.org “Practice Parameters for Identifying Cervical Spine Injuries Following Trauma” section for a detailed and excellent literature review of this topic.
DEFINITION:

1. C-Spine: Includes C1 to the upper border of T1.
2. Clearance of C-Spine: A clinical decision confirming the absence of acute bony, ligamentous and neurologic abnormalities of the cervical spine based on history, physical exam and/or negative radiologic studies.

GUIDELINES:

1. Patients should be considered to have a cervical spine injury if they present with any of the following conditions:
   a. A history of blow to the head or neck.
   b. Pain in the cervical spine or paraspinal muscles.
   c. Tenderness to palpation of the cervical spine.
   d. Traumatic brain injury and/or skull fracture.
   e. Facial injuries such as fractures, tooth loss or severe lacerations.
   f. Neurologic deficits in torso, legs or arms not explained by peripheral nerve injuries.

2. Awake patient without cervical tenderness:
   a. A patient with possible C-spine injury as defined in Section 1 above (usually based on mechanism) may have their cervical spine cleared without further radiologic evaluation if all of the following conditions exist:
      i. No neck tenderness.
      ii. No pain to palpation of cervical spine or paraspinous area.
      iii. Awake and alert with normal neurological exam.
      iv. No significant distracting pain.
      v. No associated injuries suggesting serious C-spine injury.
      vi. No pain with active range of motion of the neck.
      vii. No suspicion patient intoxication by mind altering chemicals such as alcohol or drugs.
   b. If the cervical spine is cleared under these conditions, there must be appropriate documentation in the chart.

3. Awake patient with tenderness:
   a. A patient with possible cervical spine injury as defined in Section 1 above associated with cervical tenderness should be evaluated as follows:
      i. Obtain a full cervical spine series: AP, lateral, swimmer.s view, open mouth odontoid. Trauma oblique views can be added. Films done in the Radiology Department are generally of much higher quality than portable films in the ED.
      ii. If the above films are negative, it will be the decision of the evaluating physician to clear the spine, obtain consultation or proceed with flexion/extension views, CT scan of the cervical spine or MRI. There is no evidence-based literature to support one approach over another. CT scanning is beginning to replace plain radiography in the clearance of cervical spines in some Trauma Centers.
       1) Plain radiographs and CT scanning are used to detect bony injury
       2) Flexion/extension views and MRI are used to detect ligamentous injury.
       3) clearing a cervical spine is a balance of clinical information considering mechanism of injury and physical exam coupled with some or all of the above radiological studies.
   b. If plain radiographs are suspicious, equivocal or uninterpretable, a CT scan should be obtained through the area of discomfort to further evaluate bony anatomy.
   c. If X-rays suggest bony or ligamentous abnormalities or instability, then consult Neurosurgery or Orthopedic Surgery at an appropriate referral trauma care facility.
   d. Consider an MRI in the high risk pediatric patient.

4. The patient with altered mental status and possible C-spine injury:
   a. The patient has a head injury or intoxication and cannot provide a reliable clinical exam:
      i. Obtain cross-table lateral C-spine while pulling on arms.
      ii. Obtain odontoid, anterior-posterior and oblique views.
      iii. CT scanning of the entire cervical spine with sagittal reconstruction is appropriate in these high risk patients.
      CAUTION: The CT scan may miss ligamentous injuries with no associated bony fractures.
   iv. If X-rays are negative per the attending radiologist, leave cervical collar in place until patient awakens, and examine for cervical tenderness. If the patient has cervical tenderness, then proceed with CT, flexion/extension views, and/or MRI as indicated.
   v. If the patient is not expected to provide a reliable exam, proceed with MRI of the cervical spine when patient stable.
5. If any abnormalities are found on any of the radiographs, consider consult with neurosurgery or orthopedic surgery at an appropriate referral trauma care facility. The cervical collar should be kept in place and spinal precautions maintained.

6. If there are any neurologic deficits attributable to a possible cervical spinal cord injury, consider consult with neurosurgery at an appropriate trauma care referral facility. The cervical collar should remain in place and spinal precautions observed. Radiographic evaluation of the patient may be deferred if emergent transport is deemed to be in the patient’s best interest.

7. The evaluation of the trauma patient generally includes an examination of the back. The patient should be log rolled, with manual immobilization of the head and neck. At this time the back should be inspected and clothing/debris removed from behind the patient. This portion of the exam may be deferred if it is felt that the patient is at high risk of a spinal injury and further injury is likely.

8. SUMMARY:

Patients who require radiologic clearance will follow these guidelines:

The spine remains immobilized in neutral position at all times.

The cervical collar is briefly removed in the Emergency Department with manual stabilization of the head to inspect and palpate the neck and then is reapplied.

The patient then proceeds to Radiology for the appropriate studies.

- At no time is the cervical collar removed*
- At no time is the patient placed in the lateral position.
- At no time is the spine taken out of neutral position. *
- * Unless flexion/extension views are to be performed and then only under the direct supervision of the attending physician.
- The spine is then cleared or not cleared based on the mechanism of injury, the physical examination and the radiologic studies.
- Only the attending physician using all of the above specified information discontinues spinal immobilization.