VENTURA COUNTY MEDICAL CENTER
CERVICAL SPINE TRAUMA CLINICAL PRACTICE GUIDELINE/PROTOCOL

The contents of this clinical practice guideline are to be used as a guide. Healthcare professionals should use sound clinical judgment and individualize patient care. This CPG is not meant to be a replacement for training, experience, CME or studying the latest literature and drug information.

1. All blunt trauma patients & falls should be considered as having a spinal injury until proven otherwise.
2. Maintain Cervical Spine Precautions until cleared (see pages 2-3):
    a. Strict Bed Rest
    b. Log roll by 3 staff (one at upper torso, one at lower torso/legs, one at head who controls the roll verbally)
    c. Hard Cervical Collar in Place
3. Maintain Thoracolumbar Spine Precautions until cleared (see Tharoacolumbar Spine Guideline)
4. Cervical Spine Clearance
    a. Utilize Cervical Spine Guidelines on pages 2-3.
    b. Clearance can only be performed by an Emergency Room Physician, ICU physician, Neurosurgeon, Orthopedic Surgeon, Trauma Surgeon or Resident who has been "signed off" for C-Spine Clearance.
        i. To be "signed off", the resident must:
            1. Attend the annual C-Spine Clearance Lecture
            2. Be ATLS certified
            3. Be at least a 3rd year resident
            4. Have successfully completed a written C-Spine Clearance exam
            5. Have been observed to successfully performed and cleared 3 cervical spines (with procedural sign-off)
    c. During Cervical Spine Evaluation:
        i. Logroll patient with full C-spine immobilization to determine areas of tenderness in the cervical, thoracic and lumbosacral spine. If tenderness is present, assume the spine to be unstable.
        ii. Examine for areas of increased kyphosis or spinous process step-off.
        iii. Perform neurologic exam to determine any deficits suggestive of neurologic injury.
        iv. Examine rectal tone (involuntary and voluntary).
    d. Of note, less than 1/3 of patients with cervical spine fractures will have any associated neurological deficits
    e. If a cervical spine injury is detected, a complete radiographic spine evaluation is indicated to rule out noncontiguous fractures in other areas of the spine.
5. Begin steroid protocol if complete or incomplete neuro deficit is found within 8 hours of injury (see Traumatic Spine Injury Chapter of Yellow Book)
    a. Notify Neurosurgery and Trauma Surgery prior to implementation
    b. Must also be on GI prophylaxis when on high dose steroids.

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C-Spine Clearance in the Evaluable Patient

- All blunt trauma patients should be considered as having a cervical spine injury until proven otherwise.
  - Hard cervical collar must be placed
  - C-spine precautions (log roll, elevating HOB except via reverse trendelenburg only) must be maintained
- Definition of evaluable patient (must fulfill all three criteria):
  - Glasgow Coma Scale of 15
  - Not intoxicated
  - No injury that would prevent the patient's full concentration on the exam (distracting injury)
  - Reliable clinical exam
- **Be sure to clear the TL-Spine utilizing the TL-Spine Guidelines**

FIRST STEP - Determine if patient has neurological deficits and/or Significant C-spine bone tenderness (not soft tissue)

1. Evaluable patient without cervical spine (bone) tenderness/pain and no neurological deficit.

a) No cervical spinal radiographs are required
b) The C-spine may be cleared clinically by either the attending physician or experienced resident. The physician makes the determination, removes the cervical collar and documents the patient's C-spine "clinical clearance" in the medical record.

2. Evaluable patient with significant cervical spine (bone) tenderness/pain, but no neurological deficit.

a) Plain film; laberal C-Spine demonstrating C1 & 2
b) Obtain a Non-emergent 16 channel Axial CT scan of C1-T1 with 3mm helical cuts and sagittal reconstruction
c) Urgent neurosurgical consult if either study demonstrates abnormality. Also, obtain a TL-Spine CT as described in the TL-Spine Guidelines.
d) If all studies are negative and the patients pain resolves one may clinically clear the patient as described above in 1.
e) If all studies are negative and the patient continues to complain of pain then obtain lateral upright c-spine film while patient is in hard collar
    a. If subluxation is noted: consult neurosurgery
    b. If no subluxation: maintain patient in c-collar for 2 weeks and re-evaluate at that time.
f) If patient continues to have pain after 2 weeks then obtain a non-emergent MRI
    i. Non-Emergent Neurosurgical consult if any abnormality is found
    ii. Remove collar if MRI is normal

3. Evaluable patient with neurological deficit referable to spine injury

a) Emergent Plain films and CT as described in 2a-b (also obtain TL Spine CT)
b) Emergent MRI
c) Emergent Neurosurgical consult

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C-Spine Clearance in the Non-Evaluable Patient

- All blunt trauma patients should be considered as having a cervical spine injury until proven otherwise.
  - Hard cervical collar must be placed
  - C-spine precautions (log roll, elevating HOB except via reverse Trendelenburg only) must be maintained

- Definition of non-evaluable patient (any of the following):
  - Glasgow Coma Scale <15
  - Intoxicated
  - Injury that would prevent the patient's full concentration on the exam (distracting injury

- **Be sure to clear the TL-Spine utilizing the TL-Spine Guidelines**

The following radiographic films are ordered on ALL non-evaluable patients

- Plain film: Lateral C-Spine demonstrating C1 & 2
- Axial CT scan of C1-T1 with 3mm helical cuts and sagittal reconstruction
- Either: Thoracolumbar 16 channel CT (reformatted axial or collimation) or Plain Films (AP& Lateral)

Any abnormality should result in an Urgent neurosurgical consult

1. **Patient with normal radiographic studies but they are not moving their extremities:**
   a) Non-emergent MRI (elective timing, during regular work hours)
      - If MRI is normal then a physician may remove the cervical collar after documenting the patient's "Cervical spine radiographic clearance" in the medical record.
      - If an abnormality is found then a Neurosurgical consult is obtained

2. **Patients with normal radiographic studies but with focal neurological deficits consistent with cord injury:**
   a) Emergent Neurosurgical Consult
   b) Emergent MRI.

3. **Patients with normal radiographic studies and no focal neurological defects:**
   a) If the patient is likely to become evaluable within 24 hours (ie intoxicated without neurological injury), continue spine precautions and re-evaluate once intoxication resolved based on either the Evaluable or Non-Evaluable guidelines.
   b) If a patient is unlikely to become Evaluable within 24 hours:
      - In patients ≥13 years of age - a physician may remove the cervical collar after documenting "Cervical Spine radiographic clearance" in the medical record.
      - In patients < 13 years of age - a non-emergent MRI (elective timing, during regular work hours) is ordered.
        - If an abnormality is found – obtain a Neurosurgical Consult
        - If MRI is normal – the physician may remove the cervical collar after documenting "C-spine radiographic clearance" in the medical record.

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