

Maricopa Integrated Health System: Administrative Policy & Procedure

Effective Date: 03/05

Reviewed Dates: 09/05, 9/08

Revision Dates:

Policy #: 64500 S

Policy Title: Cervical & Total Spine Clearance and Subsequent Disposition for these Trauma Patients

Scope: District Governance(G)

System-Wide(S)

Division(D)_____

Department(T)_____

Signature: _____
[Dr. David Wisinger MD – Interim Chief Medical Officer, MIHS]

Purpose:

The purpose of this policy is to provide guidelines and algorithms for evaluation and management of trauma patients with potential and/or suspected spine injuries.

Definitions:

A. Initial cervical spine (hard collar) and total spine (long board & log-roll) precautions in the Trauma Room are defined as patients that:

1. Arrive via Emergency Medical Service Providers (EMS) and have been placed in cervical spine (hard collar) and total spine precautions (long board with log-roll precautions) prior to arrival and have been identified by these providers as having a potential/and or suspected injury to their cervical, thoracic, lumbar or sacral spine.

2. Patients that self-present to the Trauma Room that may have or have sustained an injury that potentially places the patient at an increased risk for cervical, thoracic, lumbar or sacral spine injury.

B. Patients that have been identified in the Trauma Room and remain on Cervical Spine and Total Spine precautions will be identified as:

a. Unstable Cervical or Total Spine

Patients with suspected or known cervical, thoracic, lumbar or sacral spine injury on plain radiographs or computed tomography or physical evidence of injury to the spine.

b. Radiographically Clear Cervical or Total Spine

Patients that do not have evidence of cervical, thoracic, lumbar or sacral spine injury on plain radiographs, computed tomography, flexion/extension or magnetic imaging.

c. Clinically Clear Cervical or Total Spine

Except for patients cleared per NEXUS criteria, patients must first be radiographically clear. Next, patients on physical exam must have no tenderness to palpation as well as no neurological deficits with full range of motion of the cervical and/or total spine.

Policy:

Cervical Spine Clearance Policy and Procedures

A. Radiographic Studies

1. Obtain NO cervical radiographs in accordance with the NEXUS low-risk criteria. No plain cervical spine radiographs for blunt force trauma are required for patients if they exhibit **all** of the following criteria:
 - a. No posterior midline cervical tenderness
 - b. Normal level of alertness (i.e., GCS = 15)
 - c. No focal neurological deficit
 - d. No painful distracting injuries (i.e. any condition thought by the physician to be producing pain sufficient to distract the patient from realizing they may have a second injury)
 - e. No evidence of intoxication

Loss of consciousness in and of itself does not necessitate radiographic c-spine clearance.

2. Obtain 3 View cervical spine radiographs (AP, odontoid, lateral \pm swimmer's view) in Level I trauma patients with the following criteria:
 - a. No posterior midline cervical tenderness
 - b. Normal level of alertness (i.e., GCS = 15)
 - c. No focal neurological deficit
 - d. Evidence of painful distracting injury**
 - e. Evidence of intoxication**

***Computerized tomography, in the above cases, should be reserved for inadequate visualization or identification of suspicious areas on plain radiographs.

3. Obtain computerized tomography with coronal and lateral reconstruction views in all Level I trauma patients presenting with the following criteria:
 - a. Posterior midline cervical tenderness**
 - b. Evidence of Closed Head Injury with GCS < 15**
 - c. Focal neurological deficit**
 - d. Intubation**

B. Cervical Spine Patient Disposition

When possible, a trauma patients' disposition (from the Trauma Room) should occur to the appropriate patient care area:

- After an H & P and appropriate plain radiographs and CT scans have been completed
 - After a written note (in H & P or progress section) states radiographic and clinical status of cervical spine
 - After a written physician order states radiographic and clinical status of cervical spine
 - After the above are completed, the Nursing Supervisor will be notified for patient disposition.
- All of the above maybe be by-passed per Attending Surgeon and/or ED discretion

The following Clinical Pathways are for patients to be admitted to the ICU for management:

1. Patients with **abnormal cervical spine radiographs** (standard films or computerized tomography) will remain immobilized in a cervical collar and Neurosurgical or Orthopedic Spine team consultation will occur.
2. Patients with a **neurological deficit and no radiographic abnormality** identified will remain immobilized in a cervical collar and an MRI of the cervical spine will be obtained within 72 hours of injury. Neurosurgical or Orthopedic Spine team consultation will occur immediately.
3. Patients who **remain comatose or cannot be clinically evaluated at 48 hours** and who also have **normal computerized tomography of the cervical spine** will be treated with Neurosurgical consultation.

At 48 hours, the patients C-collar is to be changed to an Aspen collar. The Neurosurgical team will be responsible for subsequent cervical spine clearance. MRI or additional flexion/extension radiographs will be obtained per the Neurosurgical consultant.

If the patient regains consciousness and can be clinically evaluated prior to the 48 hours, the trauma

team will be responsible for cervical spine clearance following the above guidelines.

The following patients will be admitted to the **Floor** for management:

4. Patients with complaints of neck pain and either no radiographic abnormality or sub-optimal flexion/extension films will continue in a rigid cervical collar immobilization. An MRI of the spine may be obtained at the trauma attending's discretion. If a radiographic abnormality is noted on these subsequent examinations, Neurosurgical or Orthopedic Spine team consultation will occur. Otherwise, patients that remain in a hard cervical collar will return for Neurosurgical or Orthopedic clinic follow up in two weeks. Flexion/extension films may be obtained at that time if pain persists. An MRI may be considered at that time, however the sensitivity of this may be less if obtained after 72 hours from injury.

5. Patients with decreased level of consciousness secondary to intoxication and normal cervical spine radiographs/ computerized tomography will remain in cervical collars until a clinical exam can be performed to reliably exclude neck tenderness and assess range of motion. If the exam is normal, the cervical collar may be removed. If the exam is abnormal, then CT scan of the cervical spine will be completed if not previously obtained.

- If CT scan is abnormal, follow clinical path # 1
- If CT scan is normal, follow clinical path # 4
- If Neuro deficit is noted, follow clinical path # 2

Total Spine Clearance Policy And Procedures

A. Radiographic Studies

1. Either plain or computed tomography radiographs of the chest, abdomen and pelvis with reconstruction should be utilized to evaluate the thoracic, lumbar and sacral spine. Computed tomography should always be used if the patient is ordered to undergo computed tomography of the chest, abdomen and pelvis already performed.

2. Either the plain radiographs (AP and Lateral) or the computer tomography scans of the thoracic, lumbar and sacral spine should be obtained for:

- a. Midline thoracic, lumbar or sacral spinal pain and/or tenderness
- b. Abnormal neurological exam suggestive of spinal cord or nerve root injury(i.e. focal neurological deficit)
- c. Inability to "clear" the thoracic/lumbar/sacral spine clinically (i.e. CHI, intubation)
- d. A known cervical spine injury
- e. Suspected mechanism with a known increased incidence of thoracic, lumbar or sacral injury (i.e. falls, ejection from high speed vehicle, etc...)

* The examples listed above do not necessitate the obtaining of radiographic films. These are only examples of mechanisms that may warrant radiographic imaging.

** Computerized tomography, in the above cases, should be reserved for inadequate visualization or identification of suspicious areas on plain radiographs which must include coronal and lateral reconstruction views.

B. Total Spine Patient Disposition

When possible, a trauma patients' disposition (from the Trauma Room) should occur to the appropriate patient care area:

- After an H & P and appropriate plain radiographs and CT scans have been completed
- After a written note (in H & P or progress section) states radiographic and clinical status of the total spine
- After a written physician order states radiographic and clinical status of the total spine
- After the above are completed, the Nursing Supervisor will be notified for patient disposition.
- All of the above maybe be by-passed per Attending Surgeon and/or ED discretion

The following Clinical Pathways are for patients to be admitted to the **ICU** for management:

1. Patients with **abnormal thoracic, lumbar and/or sacral spine radiographs** (standard films or computerized tomography) will remain immobilized flat in bed with log roll precautions. Neurosurgical or Orthopedic Spine team consultation will occur immediately.

These patients do not require a spinal board for any period of time and consideration should be given to removing the spine board as soon as possible after arrival in the trauma room.

2. Patients with a **neurological deficit and no radiographic abnormality** will remain immobilized flat in bed with log roll precautions and either a computed tomography myelogram or an MRI of the thoracic, lumbar and/or sacral spine will be obtained within 72 hours of injury. Neurosurgical or Orthopedic Spine team consultation will occur immediately.

3. Patients who **remain comatose or cannot be clinically evaluated** at 48 hours and who also have **normal computerized tomography of the total spine** will be treated with Neurosurgical consultation.

The following Clinical Pathways are for patients to be admitted to the **Floor** for management:

1. Patients with complaints of thoracic, lumbar or sacral spine pain and no radiographic abnormality should undergo observation. Further plain radiographs or computerized tomography as well as an MRI of suspected areas of injury may be obtained at the trauma attending's discretion. If a radiographic abnormality is noted on these subsequent examinations, Neurosurgical or Orthopedic Spine team consultation will occur.

2. Patients with decreased level of consciousness secondary to intoxication and normal total spine radiographs/computerized tomography will remain in bed until a clinical exam can be performed to reliably exclude spinal tenderness and assess range of motion. If the exam is normal, total spine precautions will be stopped. If the exam is abnormal, then follow-up computed tomography imaging of the thoracic, lumbar and/or sacral spine will be completed if not previously obtained.

- If CT scan is abnormal, follow clinical path # 1
- If CT scan is normal, follow clinical path # 3
- If Neuro deficit is noted, follow clinical path # 2

C. Nursing Policy And Procedures

Cervical and total spine precautions as described as follows:

1. **Cervical Spine precautions will be maintained** on patients that are deemed to have an

Unstable Cervical Spine:

- a. Admission to an ICU
- b. Maintenance of a hard cervical collar at all times.
- c. Strict log-roll only procedures (No backboard required)
- d. Strict bed rest and flat in bed
- e. Neuro/sensory checks every 2 hours
- f. Placement in an Aspen cervical collar after 48 hours
- g. Skin Assessment checks a minimum of every 6 hours
- h. Collar fit checks a minimum of every 6 hours
- i. Suction equipment immediately available

2. **Cervical Spine precautions will be maintained** on patients that are deemed to have

Radiographically Clear Cervical Spine but NOT Clinically Clear Cervical Spine:

- a. Admission to either Floor, Step Down or ICU as determined by physician order
- b. Maintenance of a hard cervical collar at all times.
- c. Bed rest, out of bed to chair or ambulate with assistance per physician orders
- d. Neuro/sensory checks at least every 4 hours
- e. Placement in an Aspen cervical collar after 48 hours
- f. Skin Assessment checks a minimum of every 6 hours
- g. Collar fit checks a minimum of every 6 hours
- h. Suction equipment immediately available.

3. **Total Spine Precautions will be maintained** on patients that are deemed to have

Unstable Total Spine:

- a. Admission to an ICU
- b. Strict log-roll only procedures (No backboard required)
- c. Strict bed rest and flat in bed
- d. Neuro/sensory checks every 2 hours
- e. Skin Assessment checks a minimum of every 6 hours
- f. Suction equipment immediately available

Follow-Up Procedure

A. While the patient is in cervical and/or total spine precautions, nursing personnel will adhere to hospital policies regarding:

1. Routine Management for the Patient in a Cervical Spine Collar
2. Skin Care Guidelines for the Patient in a Cervical Spine Collar

B. Once all radiological films are completed, the patient is to be log rolled off the rigid backboard. The patient must still be considered under cervical and/or total spine precautions, including log roll precautions, but the rigid backboard is not necessary for an extended period of time.

C. Patients will remain in cervical and/or total spine precautions until

1. Further clinical and physical assessment is performed by the physicians and the patient is determined to be both radiographic and clinically cleared.

a. Appropriate documentation of any changes of cervical and/or total spine status must be written in the physician's progress notes along with a written physician order:

- If radiographs were obtained, the findings should be documented.
- Clinical exam findings should be documented (i.e. neuro/motor/sensory)
- Documentation of personnel who cleared the spine.
- The written physician order is placed in the chart must indicate that the status of the cervical and/or total spine status is Radiographic and Clinically Clear.

D. A registered nurse may remove the cervical collar on a patient whose cervical spine has been radiographic and clinically cleared, only after:

1. A physical assessment is performed by the physician.
2. An order is written to change the status of the spine precautions.

References:

- 1) Morris CG, McCoy W, Lavery GG. Spinal immobilization for unconscious patients with multiple injuries. *BMJ* 2004; 329(28):495-9.
- 2) Hoffman JR. Validity of a Set of Clinical Criteria to Rule Out Injury to the Cervical Spine in Patients with Blunt Trauma. *N Engl J Med* 2000; 343:94-9.
- 3) *Resources for the Optimal Care of the Injured Patient: 1999*. Committee on Trauma. American College of Surgeons.
- 4) Aspen Manufacturer. Recommendations for Care and Maintenance of the Aspen Collar.
- 5) Maricopa Medical Center Trauma Surgeon's Meeting (December 2002).

Keywords: cervical spine clearance, clinically clear, disposition, radiograph, stable, total spine clearance, unstable