

Title: Cervical Spine Precautions and Clearing the Cervical Spine in the Pediatric Patient
Department: Trauma Services
Effective Date: 7/2014 **Reviewed:**
Previous Version(s):
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Guidelines

The reader is cautioned to refer to the Central Policy Database for the most current version of this document and not rely on any printed version.

Approved by the Medical Executive Committee on July 11, 2014

Scope:

This guideline applies to the pediatric trauma patient at

Guideline Statement:

The intent of this guideline is to describe the steps to be followed by staff at _____ when caring for patients with actual or potential cervical spine injuries.

Definitions:

Cervical Spine Clearance: The process by which a trauma patient's cervical spine is evaluated clinically and/or diagnostically and determined to be probably free of injury or pathology with a degree of reasonable certainty.

Cervical spine (c-spine) immobilization: The patient should be positioned supine in neutral alignment with no rotation or bending of the spinal column. The cervical spine should be further immobilized with use of a rigid cervical collar. Manual control of the cervical spine must be maintained anytime the rigid collar is removed. All patients with suspected or known cervical spine injury will remain in strict supine bedrest with HOB flat or until the cervical spine is cleared or an alternate activity level order is placed by the physician.

Definitions (cont.):

Log Roll Precautions: A team approach to turning a patient with suspected spinal injuries, using minimum of three health care professionals. Team leader is at the head to maintain manual control of the cervical spine and directing the team to turn together; 2nd (and 3rd as necessary) team member will be positioned laterally of the torso to turn the patient towards them while preventing segmental rotation, flexion, extension, and/or lateral bending of the chest, abdomen, and pelvis during transfer of the patient to maintain the vertebral column in alignment during turning process. An additional team member is responsible for removing long spine board, checking skin integrity and/or changing linens and position padding. Neurologic function must be assessed after each position change. When possible, avoid rolling the patient onto the side of an injured extremity.

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Long Spine Board (LSB): A LSB is a backboard with 3 body straps, a rigid collar and head blocks all secured should be used to maintain c-spine immobilization during transport. Place padding under the child's shoulders to bring the shoulders into horizontal alignment with the external auditory meatus, which provides neutral alignment of cervical spine. The LSB needs to be removed in a timely manner to prevent skin breakdown and decubitus formation. If, for any reason, the patient must remain on the LSB following completion of trauma secondary survey, the board must be properly padded to minimize pressure-related skin complication.

Spinal cord injury without radiographic abnormality (SCIWORA): SCIWORA is a widely recognized form of spinal cord injury, occurring almost exclusively in children, and is characterized by the absence of any radiographically evident fracture, dislocation, or malalignment. Children presenting with a history of transient neurological signs or symptoms referable to the spinal cord after a traumatic event, despite the absence of objective neurological deficits with normal radiographs, may develop SCIWORA in a delayed fashion.

Guideline:

- I. All patients sustaining actual or suspected injury to the cervical spine are fully and correctly immobilized prior to or upon arrival to the ED. These patients include:
 - A. Any trauma with an altered mental status
 - B. All patients with suspected spinal cord injury who have signs and symptoms of:
 - History of transient paresthesia, abnormal sensations, shooting pain or subjective extremity paralysis
 - Complaints of neck pain, limited range of motion or tenderness over the spine
 - Presence of sensory-motor deficits
 - C. Patient in whom the mechanism of injury is likely to have resulted in significant trauma to the spine.
 - Pedestrian struck by a motor vehicle
 - Involved in MVC, including motorcycle and ATV collisions
 - All falls greater than 10 feet or > 3 times patient's height
 - Diving injuries
 - All crashes (bicycle, skateboard) where the patient was thrown
 - Mechanisms raising a high index of suspicion
- II. All patients will remain immobilized in c-spine precautions until their cervical spine is cleared.
- III. Overview of cervical collar placement

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- A. Place patient in rigid cervical collar (i.e., Aspen®, Miami Jr®) with care exercised with infants, as the skull is disproportionately large with respect to body size. Undue hyperflexion should be avoided by placing padding behind the shoulders.
 - B. All patients with suspected or known cervical spine injury will remain in supine bedrest with HOB flat or reverse Trendelenburg until the cervical spine is cleared or an alternative activity order is received by the physician.
 1. The patient should be “log-rolled” by a minimum of three persons when transferred or turned with head control maintained per log roll precautions.
 2. A neurological assessment must be documented before and after each patient transfer or turn.
 3. Potentially life-threatening airway, breathing or circulation issues must take priority over prolonged cervical spine evaluations and radiographs.
 4. Contraindications include compromised airway with severe facial trauma and massive neck swelling as result of tracheal injury
 5. Physicians must document c-spine clearance in the medical record.
 6. For **All** cervical spine injuries or bony abnormalities with or without neurological compromise, notify neurosurgery or spine surgeon, as appropriate.
- IV.** Radiographic clearance requires:
- A. In the case of an abnormal neurological exam, magnetic resonance imaging (MRI) of the region of suspected neurological injury is recommended, especially in a patient with suspected SCIWORA.
 - B. If neurological exam is normal, recommend Standard 3 views (lateral, AP, and odontoid). If the patient is uncooperative consider only lateral and AP.
 - If less than 9 years old and planning a head CT, consider CT head and C1-C3.
 - C. If lower cervical **spine** visualization is inadequate on the lateral x-ray, may try swimmer’s view. If still inadequate, consider CT through the poorly visualized level(s).
 - D. Radiologist reading of films as negative and documented in the medical record.
- V.** Patients may be cleared clinically without radiologic studies if they meet ALL of the following criteria:
- A. No focal neurological deficits
 - B. A patient with GCS 15 with no distracting injury and/or symptoms not masked by pain medications
 1. Clinical examination of the patient by an attending MD from emergency medicine, pediatric intensive care, trauma surgery, neurosurgery or orthopedic service that results in no significant midline cervical spine tenderness and full active range of motion including flexion/extension AND rotates 45 degrees to both sides with no pain.
- VI.** If the Cervical spine cannot be cleared due to plain film radiographs or clinical findings.
- A. **ALL** patients who have **not** had cervical spine cleared within 6 hours will have the extrication cervical collar changed to a properly fitting rigid cervical collar. This collar is available in SPD.

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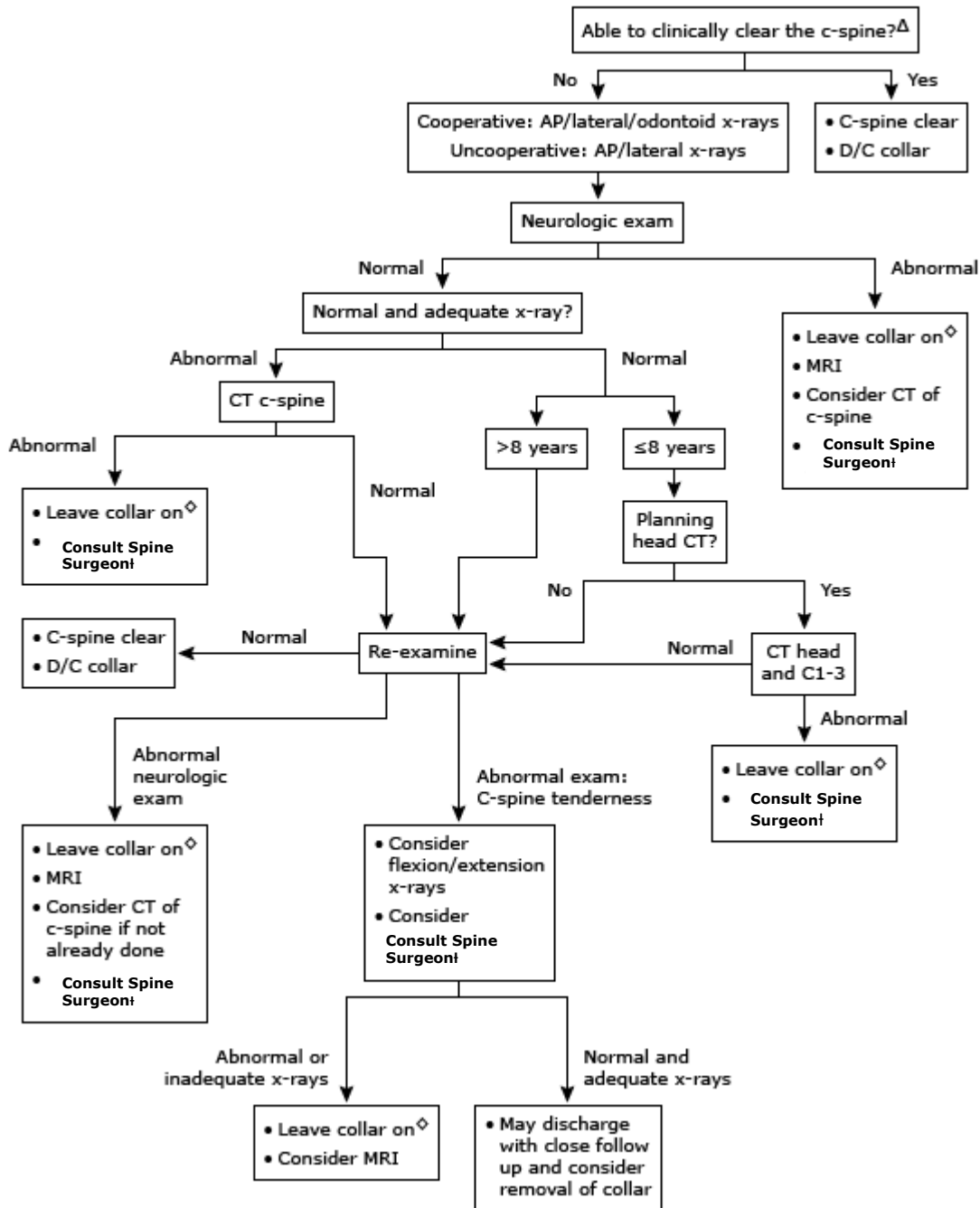
- B. For patients with radiographic clearance who have persistent tenderness on palpation or with active range of motion, consider performing a CT or MRI.
- C. If the CT is normal, then an option is to have the patient receive patient controlled, flexion/extension x-rays.
- D. If neurologic examination is abnormal, consider MRI.

VII. Algorithm “Guideline for clearing the cervical spine in the reliable pediatric patient” and “Guideline for clearing the cervical spine in the unreliable pediatric patient” Images follow on page 5 and 6

Standard / Reference & Year:	<ul style="list-style-type: none"> • Caviness, A. C. (2013, June 20). Evaluation of cervical spine injuries in children and adolescents. UpToDate. Retrieved from http://www.uptodate.com/contents/evaluation-of-cervical-spine-injuries-in-children-and-adolescents • Chung S, Mikrogianakis A, Wales PW, et al. Trauma Association of Canada Pediatric Subcommittee National Pediatric Cervical Spine Evaluation Pathway: Consensus Guidelines. J Trauma 2011; 70:873. • Advanced Trauma Life support for Doctors: 7th edition; American College of Surgeons Committee on Trauma. • Trauma Nursing Core Course, Emergency Nurses Association, Sixth edition, 2007. • Rozzelle CJ, Aarabi B, Dhall SS, Gelb DE, Hurlbert RJ, Ryken TC, Theodore N, Walters BC, Hadley MN. Spinal cord injury without radiographic abnormality (SCIWORA). In: Guidelines for the management of acute cervical spine and spinal cord injuries. Neurosurgery. 2013 Mar;72(Suppl 2):227-33.
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Cervical Spine Precautions and Clearing the Cervical Spine in the Pediatric Patient

Trauma Association of Canada (TAC) national pediatric c-spine evaluation pathway: Reliable* clinical exam



c-spine: cervical spine; MRI: magnetic resonance imaging; CT: computed tomography; LOC: level of consciousness.

* Unconscious or decreased level of consciousness with Glasgow coma scale <15.

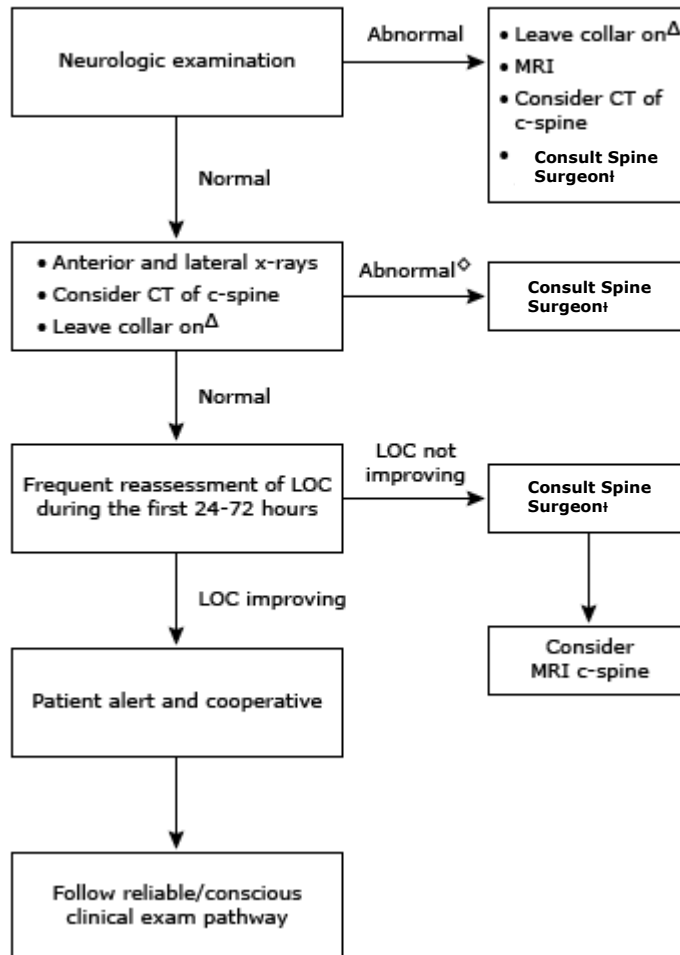
Δ Change to long-term cervical spine collar as soon as appropriate.

◇ Consider thoracolumbar spine injury in those with a documented cervical spine injury.

† Spine Surgeon could include neurosurgeon and/or orthopedic surgeon

Guideline for clearing the cervical spine in the unreliable pediatric patient

Trauma Association of Canada (TAC) national pediatric c-spine evaluation pathway: Unreliable* clinical exam



c-spine: cervical spine; MRI: magnetic resonance imaging; CT: computed tomography; LOC: level of consciousness.

* Unconscious or decreased level of consciousness with Glasgow coma scale <15.

Δ Change to long-term cervical spine collar as soon as appropriate.

◇ Consider thoracolumbar spine injury in those with a documented cervical spine injury.

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