

Title: CERVICAL, THORACIC, LUMBAR OR SACRAL SPINE OR SPINAL CORD INJURY, KNOWN OR SUSPECTED, CARE OF THE PATIENT

Scope:

This policy applies to MultiCare Health System (MHS) Emergency Department and hospitalized patients with known or suspected cervical, thoracic, lumbar, and/or sacral spinal cord injuries. This policy is also used collaboratively as a Joint Level II Trauma Policy for Tacoma General Hospital, St. Joseph Medical Center and Mary Bridge Children’s Health Center.

Policy Statement:

This policy establishes guidelines for health care providers to assure the safe care of the patient with a known or suspected spine injury, clarify precautions to be taken, and identify physician and nursing responsibilities pertinent to the defined patient population.

Special Instructions:

1. See the attached department specific algorithms at the end of document or tools developed to assist the providers in decision making.
2. For patients in full c-spine precautions do not place on any air-assisted safe patient handling mat or mattress.
3. Must have physician order to remove collar.

Procedure/Guideline:

I. The following have specific responsibilities:

A. Physician or ARNP / PA:

1. Maintain patent airway; order oxygen as appropriate
2. Perform primary survey, including Glasgow Coma Scale, secondary survey; obtain history and MOI (mechanism of injury)
3. Maintain spine immobilization if the patient is severely injured, has abnormal vital signs, or multi-system trauma, the cervical spine precautions will remain in place, pending further evaluation
4. Order radiographic studies as needed
 - a. Preferred Radiographic evaluation of suspected cervical spine injury is CT scan of cervical spine, (except in children) although 3-view cervical spine x-rays is acceptable if:

- 1.) Lateral Cervical Spine Radiograph: must be good quality and adequately visualize the base of the occiput to the upper part of the first thoracic vertebrae
- 2.) Anteroposterior Cervical Spine Radiograph: must reveal the spinous processes of C2 to C7
- 3.) Open Mouth Odontoid Radiograph: must visualize the entire dens and the lateral masses of C1
- 4.) Include the following views if indicated:
 - a.) Lateral oblique radiographs
 - b.) Flexion/extension radiographs
 - c.) Cervical computerized axial tomography
 - d.) Cervical magnetic resonance imaging
- b. If Spinal Cord Injury Without Radiographic Abnormality (SCIWORA) is suspected, additional imaging with cervical MRI is recommended
5. All studies must be technically adequate and reviewed by attending physician or radiologist
 - a. The attending physician will determine the need for additional imaging to clear the thoracic, lumbar and/or sacral spine based on symptoms and/or physical exam.
 - b. Entire spine should be imaged if an acute spine injury is seen.
6. Consult with orthopedic/spine physician and/or neurosurgeon as appropriate
7. Determine if the cervical spine is radiographically normal. If radiographically normal, clinical clearance should be attempted as soon as possible (See #11 below)
8. Complete the Physician's Order for Spine Precautions order set, or indicate level of spine precautions (if indicated) on physician's orders.
 - a. Patients with documented acute thoracic, lumbar and/or sacral fracture should be placed in full spinal precautions, strict bedrest, and log roll only until deemed stable by spine consultant.
 - b. Patients with no concern of acute thoracic, lumbar, and/or sacral injury can mobilize in a rigid cervical collar.
9. Document assessments and treatments in the patient's medical record
10. Non- radiographic (clinical) cervical spine clearance:
 - a. The cervical spine may be cleared by attending level physician or

designee if ALL of the following criteria are met:

- 1.) No focal neurological deficit, complaint on exam or history
 - 2.) No posterior, midline spinal tenderness on palpation even with full range of motion of neck
 - 3.) No evidence of intoxication (ETOH, recreational drugs, or drugs of abuse)
 - 4.) No altered level of consciousness
 - 5.) No distracting pain
- b. Document the non-radiographic (clinical) clearance in the patient's medical record and remove the collar
11. Special consideration should be taken with children under two years of age
 12. Consider removal of the backboard as soon as possible
 13. If the cervical spine cannot be cleared clinically or radiographically, then cervical spine precautions must be maintained with an appropriate sized, padded, rigid cervical collar, i.e. Vista collar
- B. RN or Designee (RN may delegate actions according to MHS scope of practice):
1. Maintain/monitor airway and breathing
 - a. Administer oxygen and assure adequate respiratory excursion
 - b. Prepare for mechanical ventilation as needed
 - c. Note respiratory pattern, rate, and effort
 2. Maintain spine alignment
 - a. When moving patient or removing any part of the cervical collar or orthotic device for patient care, maintain the spine alignment in a neutral position
 - b. Adequate personnel should be present when moving the patient in spinal precautions to assure spinal alignment
 - c. Observe and maintain neck in a neutral position with no rotation, no flexion, no extension, no jugular compression
 3. Maintain/monitor blood pressure, heart rate, and temperature
 - a. Initiate and/or maintain IV lines and infuse fluids as ordered
 - b. Document serial vital signs per physician's order and as indicated
 4. Monitor neurological signs- at the same frequency as vital signs
 - a. GCS or neurological assessment - for Emergency Department patients document GCS every hour or as indicated

- b. Movement of extremities/grips
- c. Sensory and motor function
- 5. Monitor risk for aspiration
 - a. NPO (Nothing by Mouth), until further orders
 - b. Have oral suction ready at bedside
 - c. Monitor swallow ability
 - 1.) Order swallow screen if indicated
- 6. Assess comfort level and tolerance of collar
 - a. Assess pain, spasms, and anxiety level, and medicate if ordered and indicated
 - b. Provide comfort measures, and reassurance
 - c. If necessary obtain order for restraint per MHS restraint policy to maintain spinal precautions for patient safety
- 7. Provide and direct care for the patient in a cervical spine collar
 - a. Routine skin care of the trauma patient includes the removal of the rigid cervical collar and application of appropriately sized hard cervical collar, according to the manufacturer's instructions within 24 hours of admission
 - b. All patients with cervical immobilization devices should be assessed for alterations in skin integrity every 8 hours and PRN
- 8. Documentation and notification:
 - a. Document all nursing assessment and findings in the patient's medical record
 - b. Notify Physician or physician's assistant of any adverse findings from ongoing assessment
- 9. Provide patient and family education
- 10. Reportable Concerns:
 - a. Report the following conditions to the physician:
 - 1.) Onset of neck spasms or discomfort related to the collar.
 - 2.) Changes in numbness or tingling of neck/extremities, decreased or increased sensation.
 - 3.) Changes in motor function.
 - 4.) Changes in skin integrity.
 - 5.) Alteration in patient's behavioral status that places patient at risk for further spinal injury.

6.) Impaired swallow, or risk for aspiration.

7.) Respiratory difficulties, including chest wall asymmetry.

II. Collar may be removed if necessary for emergent airway management as approved by trauma surgeon or physician.

- A. Hemodynamic changes from baseline status (decreased pulse, decreased blood pressure, etc., that would indicate neurogenic shock).
- B. Changes in baseline neurological assessment and/or Glasgow coma scale.
- C. If patient removes the collar.
 - 1. Safety Concerns:
 - a. When removing any part of the collar, maintain neutral neck alignment. For patients with clinical suspicion of fracture or unstable cervical spine, obtain physician order. Always utilize minimum of two additional staff assists, assigning one person to hold the neck in neutral alignment.
 - b. Log roll patient while maintaining full spinal precautions.
 - c. Ensure that velcro tabs are securely fastened at all times.
 - d. Ensure that collar does not put pressure on trachea or jugular veins, and/or impedes with any airway patency.

III. Definitions:

C spine: cervical spine

T spine: thoracic spine

L spine: lumbar spine

S spine: sacral spine

C collar: cervical collar

GCS: Glasgow Coma Scale

Orthotic: fitted orthopedic appliance

Full Spine Precautions: Cervical, Thoracic, Lumbar or Sacral spine injury has not been cleared, or an injury has been diagnosed. Patient requires a hard cervical collar at all times (collar may be removed if necessary for emergent airway management as approved by trauma surgeon or anesthesiologist or emergency department physician), if in cervical spine precautions.

- 1. Full log roll with additional manual cervical immobilization when moving patient, if in cervical spine precautions.
- 2. Patient on bedrest only.
- 3. Patient must be on an overlay mattress or Roto bed.

	<p>4. Patient cannot be placed on air or low airloss therapy surface unless specifically ordered by Trauma Surgeon or Neurosurgeon.</p> <p>5. Head of bed must be flat at all times. May use reverse trendelenberg or trendelenberg, if indicated.</p> <p>Partial spine precautions: Cervical spine has been cleared radiographically, but patient is unable to cooperate with a physical exam and may have a probability of ligament injury.</p> <ol style="list-style-type: none"> 1. When Thoracic, Lumbar and/or Sacral spine(s) are cleared or stabilized: <ol style="list-style-type: none"> a. Patient should continue to wear hard cervical collar at all times. b. Patient requires assistance when moving. c. Log rolling is not necessary. d. Maintain bedrest until activity level clarified with physician. 2. When patient's Cervical, Thoracic, Lumbar and/or Sacral spine(s) are cleared: <ol style="list-style-type: none"> a. Physician's order must be written to change or discontinue any spine precautions.
	<p>Related Policies:</p> <p>MHS P & P: <i>"Restraint and Seclusion"</i></p> <p>MHS P & P: <i>"Pressure Ulcer Prevention, Assessment and Care"</i></p> <p>MHS P & P: <i>"Trauma Spine Precautions and Cervical Clearance Guideline for MHS LEVEL III Trauma Centers"</i></p>
	<p>Related Forms:</p> <p>Physicians Orders for Spine Clearance</p>
	<p>Attachments:</p> <p>Attachment 1: Algorithm Guideline for Adult Trauma Patient with Cervical Spine Injury</p> <p>Attachment 2: Algorithm Guideline for Pediatric Trauma Patient with Cervical Spine Injury</p> <p>Attachment 3: Algorithm Guideline for Pediatric Trauma Patient with Possible Cervical Spine Injury</p>
	<p>References:</p> <p>Committee on Trauma American College of Surgeons. (2006). Resources for the optimal care of the injured patient</p> <p>Hendey, G.W., Wolfson, A.B., Mower, W.R. & Hoffman, J.R. (2002). Spinal cord injury without radiographic abnormality: Results of the national emergency x-radiography utilization study in blunt cervical trauma. <u>Journal of Trauma Injury, Infection, and critical care</u>, 53 (1), 1-4.</p>

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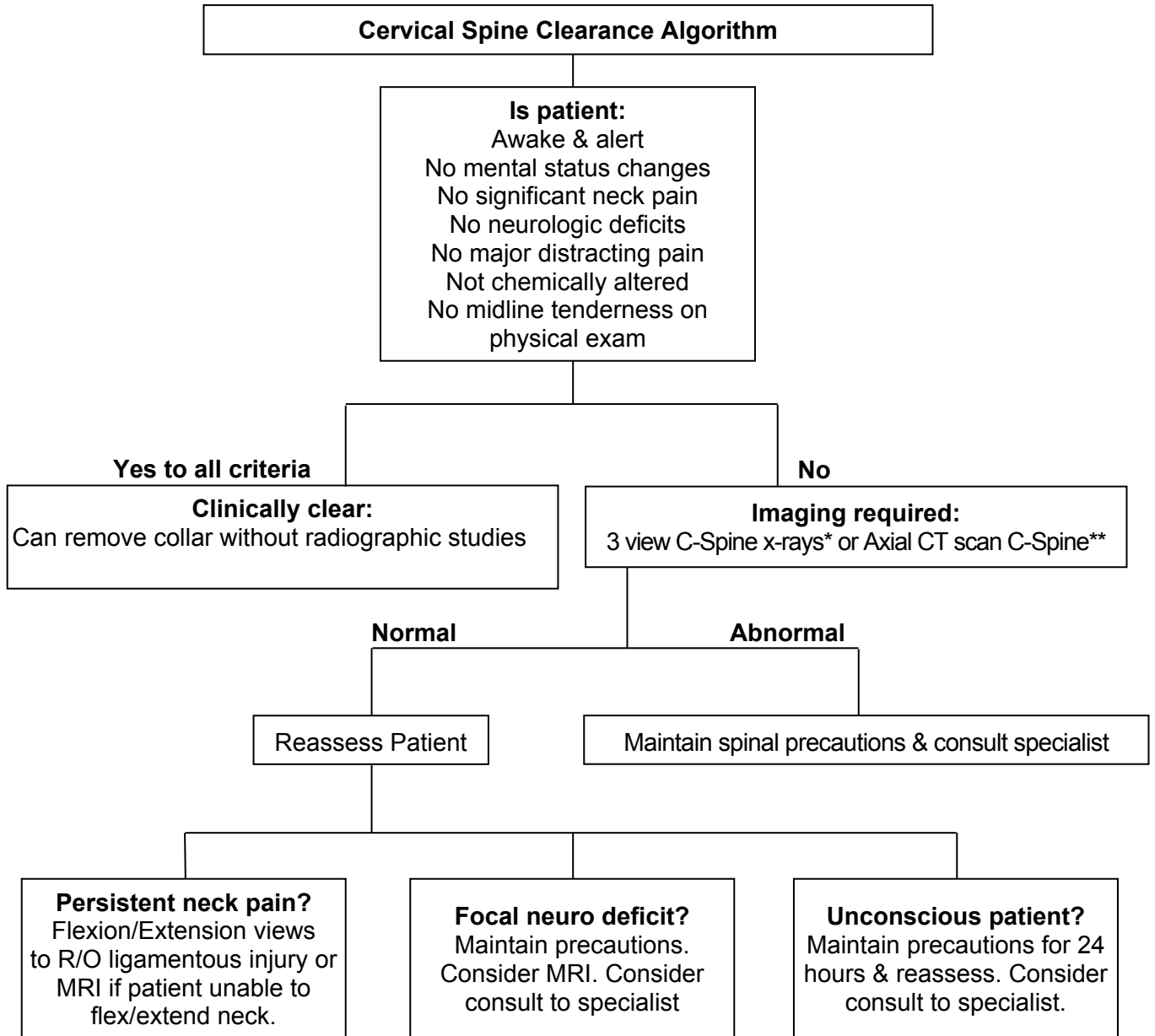
3/04; 10/08; 8/09; 7/11; 1/12, 7/14

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SPINE PRECAUTIONS PROTOCOL



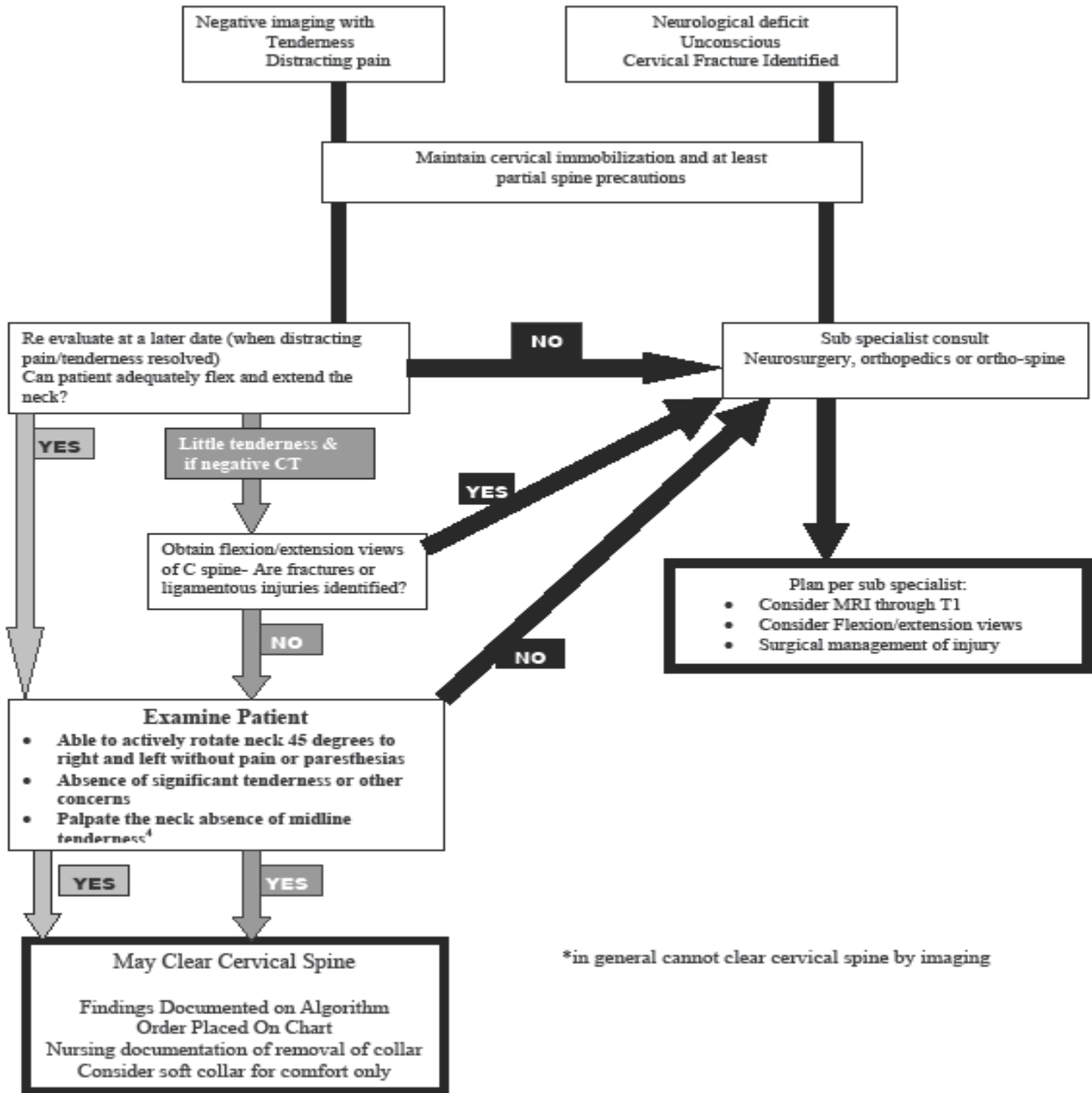
* 3 view imaging includes: lateral view from base of occiput to upper border of T1, anteroposterior view extending to T1, and open mouth odontoid view revealing lateral masses of C1 and entire odontoid process.

** Axial CT of entire C-Spine with sagittal reconstruction is preferred for patients requiring Head CT or those with abnormal or inadequate X-ray imaging. Intubated patients require Axial CT for C1-C2 as open mouth odontoid views are inadequate.

*** This algorithm is to be used by M.D. or P.A. only.

Attachment 2 – Algorithm Guideline for Pediatric Trauma Patient with Cervical Spine Injury

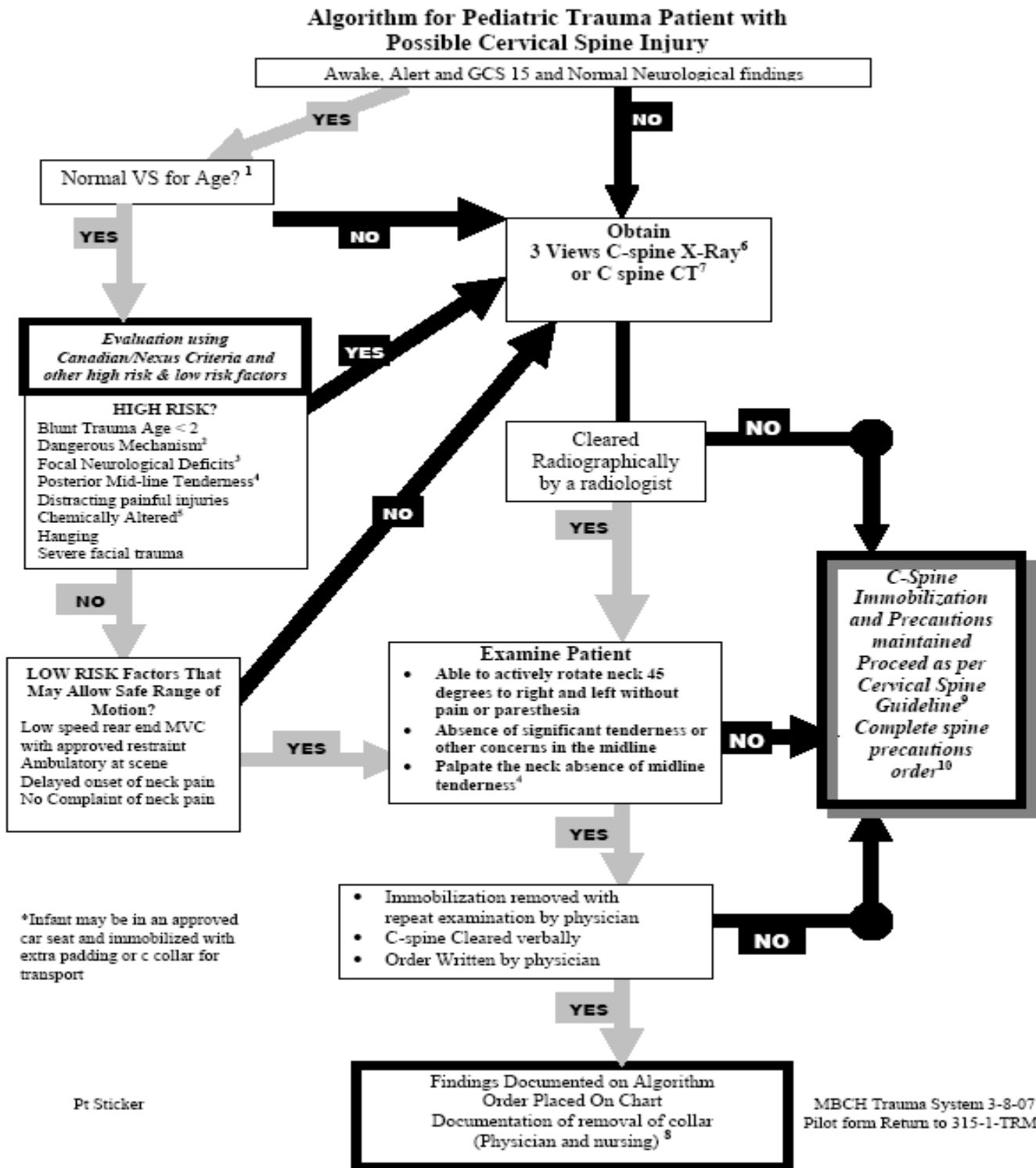
Algorithm Guideline for Pediatric Trauma Patient with Cervical Spine Injury



*in general cannot clear cervical spine by imaging

MBCH Trauma System 3-8-07
Pilot form Return to 315-1-TRM

Attachment 3 – Algorithm for Pediatric Trauma Patient with Possible Cervical Spine Injury



Algorithm for Pediatric Trauma Patient with Possible Cervical Spine Injury

1. **Lower limit Systolic BP for age**
 - a. <60 mm Hg in term neonates (0 to 28 days)
 - b. <70 mm Hg in infants (1 month to 12 months)
 - c. <70 mm Hg + (2 x age in years) in children 1 to 10 years
 - d. <90 mm Hg in children ≥ 10 years of age
2. **Dangerous mechanisms of may include:**
 - a. Fall from >1 meter or 5 stairs,
 - b. Axial load to head e.g. diving,
 - c. High speed motor vehicle collision (i.e. high speed > 60 miles per hour, rollover or ejection),
 - d. Motor vehicle collision, unrestrained,
 - e. Motorized recreational vehicles,
 - f. Bicycle, Skate Board, Snow Board collision,
 - g. Low-speed rear-end motor vehicle collision
 - h. MVC pushed into oncoming traffic
 - i. MVC hit by bus/large truck
 - j. MVC hit by high-speed vehicle
3. **Focal neurological deficits**
 - a. Paresthasias burning tingling in any of 4 limbs? If appropriate, assess for any dermatomal sensory deficits See also if any neurological symptoms.
4. Palpate the neck for **posterior midline tenderness** from nuchal ridge to prominence of first thoracic spine, assessing for pain at any level
5. Chemically altered with alcohol, street drugs, narcotics, analgesics or sedatives
6. Lateral to include T-1, AP, and good visualization of odontoid
7. **Indications for C-spine CT instead of plain x-ray:**
 - a. CT in high risk patients
 - Focal neurology deficit
 - Severe head injury- unconscious, skull fracture
 - Pelvic fracture
 - High energy mechanism:
 - Motor vehicle crash with ejection, rollover
 - High speed mechanism
 - Death in same vehicle
 - Auto vs pedestrian
 - b. CT for logistical reasons
 - Patient already in CT scanner and c-spine exam is indicated.
 - Unable to attempt odontoid
 - c. No extra plain film radiographs are necessary if CT is performed.
 - d. Imaging results per radiologist
8. **Provider documentation:** findings documented on algorithm and order placed on chart.
Nursing documentation: time and date cervical spine precautions and collar was discontinued and by whom.
9. Refer to Algorithm Guideline for Pediatric Trauma Patient with Cervical Spine Injury.
10. Spine precautions order to indicate the level of spinal precautions (full or partial) including activity order

Pt Sticker

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