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Clinical Resource: Cervical Spine Clearance

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This clinical resource was developed based on a systematic review of the current scientific and clinical information and accepted approaches to treatment and/or diagnosis. This guideline is not intended to be a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. Patient care and treatment should always be based on a clinician's independent medical judgment, given the individual patient's clinical circumstances.

SCOPE:

This resource's scope includes:

- All employees, including contracted staff and physicians
- All students / residents

NOTE: If the scope does not apply to all Children's Nebraska departments, it must be noted here. There are no exceptions.

PURPOSE:

To provide guidelines and recommendations for the evaluation of the cervical spine in pediatric trauma patients at Children's Nebraska (Children's).

CAREGIVER ALERT:

Allow patient to remain in position of comfort; provide immobilization. If C-collar indicated see policy ED-C14 v2 Cervical Collar.

Objectives:

1. To ensure compliance with the vision of Children's Nebraska to deliver the highest quality of care to all

acutely injured pediatric patients suspected of having a cervical spine injury.

2. To publish evidenced based guidelines for clinical and radiographic clearance of the cervical spine in children in the hope of minimizing unnecessary ionizing radiation during the trauma evaluation, as this is recognized as an increasingly potential cause of long-term morbidity.

Guidelines:

1. Trauma patients often require cervical spinal motion restriction following initial injury. Treatment is usually initiated by EMS. Placement of a rigid cervical collar for cervical spinal motion restriction and backboard for thoracolumbar motion restriction is standard.

2. Clearance of the cervical spine in a patient without acute neurologic deficits is a clinical event and never an emergency. Every effort should be made to clinically clear a patient prior to imaging. Due to the physiologic variations in the pediatric cervical spine, false positives in imaging are relatively common. Clinical clearance should be attempted prior to imaging IN THE STABLE PATIENT.

3. Preverbal children can be cleared clinically as essentially all children who are neurologically intact will have clinical evidence of a cervical spine injury on exam if one is present (Hale, Vieretti).

4. Evidence in support of clinical clearance:

A. Pediatric patients may be “clinically cleared” and have the collar removed under the following circumstances:

1. The child able to verbalize (age > 3 years): Subgroup analysis of the NEXUS dataset as well a prospective validation studies have established the utility of applying these criteria to children:

- No midline neck pain or tenderness
- No intoxication
- No distracting injury
- No focal neurologic deficit
- No altered level of consciousness

5. The preverbal child (age < 3 years): The American Association for the Surgery of Trauma (AAST) has published independent predictors of cervical spine injury in these patients based on retrospective review of a prospectively collected database of 12,000 preverbal children.

- A weighted scoring system was derived from 8,000 of these patients and validated with the remaining, risk factors for cervical spine injury were identified as older age (more than 24 months), motor vehicle collision, and GCS of < 14.
- It is worth mentioning that this large study identified an exceedingly low (0.66%) cervical spine injury rate in this age group.
- Of the 5 injuries that were missed with this protocol, all were managed non-operatively, and all had significant findings on physical exam which were indicative of a significant injury (severe head injury, facial fracture, neck splinting).

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- A recent study of preverbal trauma patients by Hale et al. confirmed that cervical spine injury in a neurologically intact child (GCS of 15) is exceedingly rare in the absence of clinical findings (neck pain/tenderness or torticollis).
- In general, in a neurologically normal infant or toddler without neck pain or tenderness and with full active range of motion of the neck, and who does not have a suspicious mechanism (i.e., MVC), the collar can be removed without imaging.

6. Pediatric patients who have a GCS of 15, are alert and cooperative with a physical exam, and have no focal neurologic deficits, will be temporarily taken out of the collar for a physical exam of the cervical spine.

- If they have no pain or tenderness over the spine, no torticollis, and full range of motion without pain or discomfort, the collar can be removed and they can be clinically cleared.
- If they have significant evidence of direct external trauma to the face, head, or neck that limits the exam, then clinical clearance should be deferred until these injuries are fully evaluated and the cervical spine should be imaged with plain films.

7. For those patients who cannot be cleared clinically, imaging guidelines are as follows:

- If the head is being scanned, it is reasonable to extend the study through C1 and C2 instead of obtaining an open mouth view, particularly in very young children who are more prone to injuries in this location.

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8. If injury is found or if the patient has a focal neurologic deficit the Neurosurgery team will be consulted.

9. It should be kept in mind that neither CT or plain films is adequate to exclude ligamentous, spinal cord, or cervical soft tissue injury in children.

- Therefore, if no injury is found and the patient cannot be clinically cleared on repeat exam, the collar will be left in place.
- In general, these patients will likely be admitted for observation and re-examined.
- However, if they do not require admission and the clinical suspicion for injury is low, then discharge home in a collar with scheduled follow up in 7-14 days is reasonable.
- Prior to discharge, all imaging must be final reads by Radiology.
- For patients with a very concerning clinical history or mechanism of injury, MRI either urgently or within 72 hours should be considered.
- For patients who are obtunded and expected to be neurologically altered for an extended period, cervical spine clearance should be done with MRI within 48 hours.
- The Neurosurgery Service will be consulted if an injury is identified.

10. Patients should be taken off the backboard following initial resuscitation to minimize the chance of skin breakdown, aspiration, and other pulmonary compromise.

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Attachments

Image 01

Approval Signatures

Step Description	Approver	Date

Medical Director	Angela Hanna	11/2023
Owner/SME - Manager	Jessica Lee	10/2023

Standards

No standards are associated with this document

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