Cervical Spine Injury Evaluation

Emergency Department

Nationwide Children's — When your child needs a hospital, everything matters.

Center for Clinical Excellence

Inclusion Criteria
- Blunt trauma mechanism without known cervical spine injury

Exclusion Criteria
- Penetrating trauma mechanism
- Known Cervical spine injury prior to arrival (Maintain c-collar)

Signs & Symptoms
- Altered mental status
  - -GCS ≤ 14
  - -Intoxication
- Abnormal airway, breathing or circulation
- Focal neurologic deficit
- Self-reported posterior midline neck pain
- Posterior midline neck tenderness on examination
- Substantial head or torso injury

For patients with concern for non-accidental injury, refer to the Non-Accidental Clinical Pathway and discuss further radiology studies with the Child Assessment Team

Cervical Collar Care
Replace transport collar with rigid collar within 4 hours of arrival if collar not cleared

Patient presents for evaluation after blunt trauma mechanism

Assess need for cervical collar if not present on presentation

Differential Diagnosis

GCS 3-8 or abnormal findings on airway, breathing, circulation exam or focal neurologic deficit on exam

Yes
- Apply cervical collar if not present Patient/Family Care General Procedure 95:50 Cervical Collar Application and Care
- Obtain Cervical CT w/ reconstruction
- Consider CTA Trauma Program Guideline T-51 Head and Neck Vascular Imaging for Blunt Trauma
- If patient unstable for CT, obtain portable AP/Lat/Odontoid films and maintain cervical collar
- Go to **Inpatient Pathway**

If at LCED or UC, transfer to MCED

No

When a well fit collar is in place, in-line manual stabilization is not required except in movement of an unconscious patient or in log-rolling during the primary survey.

GCS 9-14 or other signs of altered mental status or self-reported posterior midline neck pain or tenderness on exam or substantial head or torso injury?

Yes
- Apply cervical collar if not present Patient/Family Care General Procedure 95:50 Cervical Collar Application and Care
- Obtain cervical spine AP/ Lat (+Odontoid if ≥4yo)

No

Cervical Spine Injury Cleared

No

Injury findings on imaging?

No
- Persistent midline bony tenderness or limitation/pain in range of motion?
- Consider distracting injuries

Yes

Patient warrants admission?

Yes

Admit to Pediatric Surgery or Neurosurgery following the trauma admission matrix

Consult Neurosurgery if not already consulted

No

Go To Inpatient Pathway

Discharge to Home
- Replace transport collar with homegoing collar
- Follow-up with Neurosurgery in 2 weeks
- Provide Helping Hand – Cervical Collar (Aspen) II-159

Cervical Spine Injury Evaluation

Inpatient

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Center for Clinical Excellence

Inclusion Criteria
- Blunt trauma mechanism without known cervical spine injury

Exclusion Criteria
- Penetrating trauma mechanism
- Known Cervical spine injury prior to arrival (Maintain c-collar)

- Patient admitted with cervical collar after blunt trauma mechanism
- Follow **Patient/Family Care Procedure XI-95:50 Cervical Collar Application and Care**

Cervical Collar Care
- Replace transport collar with rigid collar within 4 hours of arrival if collar not cleared
- **Patient/Family Care General Procedure 95:50 Cervical Collar Application and Care**
- Place "High-back" cervical collar for neurologic compromise and inability to clear collar in early period; place a small pressure redistribution pillow under the head

Unable to examine due to neurologic status and expected to be prolonged, or unable to image due to patient stability?

Yes
- Place "High-back" cervical collar
- Place small pressure redistribution pillow under the head

No

Obtain recommended imaging when able if not performed in ED
*Refer to **ED Pathway** for guidance

Injury findings on imaging?

Yes → **Off Pathway**
Consult Neurosurgery for management

No

Persistent clinical exam findings:
- Self-reported posterior midline neck pain
- Tenderness on exam
- **Consider distracting injuries**

No → **Cervical Collar Cleared**
Document using "Cervical Spine Clearance Note"

Yes
- Consult Neurosurgery if not already consulted

Collar cleared by Neurosurgery?

Yes → **Cervical Collar Cleared- verify with Neurosurgery**
Document using "Cervical Spine Clearance Note"

No
- Consult Neurosurgery if not already consulted
- Consider MRI (Obtain within 72 hours of injury if indicated)

MRI Obtained and negative for cervical spine injury?

Yes → **Cervical Collar Cleared- verify with Neurosurgery**
Document using "Cervical Spine Clearance Note"

No
Neurosurgery to determine duration of therapy and follow-up imaging

MRI not obtained
- Maintain "High back" Cervical collar for neurologically impaired patients
- Consider Cervical Flexion/ Extension films for cooperative patients(decision by Neurosurgery)

If discharged to home in a collar
- Family to return demonstration of collar removal and application
- Follow-up with Neurosurgery in 2 weeks
- Provide Helping Hand – **Cervical Collar (Aspen) II-159**

Considerations in Concern for Cervical Spine Injury

- **Substantial head or torso injury:** injury to the head, chest, abdomen, or pelvis that will require admission to the hospital for observation or surgery
- **Substantial distracting injury** is present when pain or anxiety interfere with the assessment of pain and/or ROM. The presence of an injury in an otherwise calm and cooperative patient is not considered distracting and cervical collar clearance can and should proceed.

Return to Emergency Department Algorithm

Return to Inpatient Algorithm

Differential Diagnoses

- Cervical Spine Fracture
- Cervical Spinal Cord Injury
- Cervical Ligament Injury
- Neck Strain

Return to Emergency Department Algorithm

Return to Inpatient Algorithm

Diagnostic Testing

Cervical Spine Radiographs
- Obtain AP/Lateral for ages 0-3 years and patient unable to cooperate with exam
- Obtain AP/Lateral/Odontoid for ages 4 years and above if able to cooperate during exam

Cervical Flexion/Extension
- Only obtained at the direction and to be performed by Neurosurgery

Cervical Spine CT with Reconstruction
- Indicated if other CT scans are being obtained
- Consider CTA neck per: **Trauma Program Guideline T-51 Head and Neck Vascular Imaging for Blunt Trauma**

MRI Cervical Spine without contrast
- Obtain within 72 hours of injury if indicated, consult Neurosurgery prior to ordering

Return to Emergency Department Algorithm

Return to Inpatient Algorithm

Metrics

Pathway Goal

- To reduce variation in cervical spine injury evaluation and support efficient evaluation of potential cervical spine injuries.
- To expedite the clearance of cervical spine precautions and reduce the risk of complications of cervical collar utilization.

Quality Measures

Outcome Metrics

- Primary Outcome metric: Reduction in time from admission to cervical collar clearance
- Reduction in cervical collar related pressure injuries

Process Metrics

- Pathway Tool Utilization

Balancing Metrics

- Increase utilization of CT scans

Return to Emergency Department Algorithm

Return to Inpatient Algorithm

Patient & Caregiver Education

- ED and Inpatient discharge instructions
- Provide patient education documents:
  - **Helping Hand: Cervcial Collar (Aspen) HH-II-159**
- RN instructs and has caregiver(s) return demonstration of cervical collar removal/ application and skin inspection prior to discharge.

Return to Emergency Department Algorithm

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References

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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