Cervical Spine Clearance

Cervical spine injuries, though rare in children, can occur from any mechanism of trauma. This tool applies to patients who were evaluated at a Cincinnati Children’s emergency department or urgent care center with concern for neck injury and:

- Had midline cervical tenderness
- Had negative cervical spine X-rays
- Were discharged home in a cervical collar (c-collar) due to ongoing cervical spine tenderness and/or pain with range of motion
- Were instructed to wear the c-collar 24/7 and follow-up with their PCP or Cincinnati Children’s Trauma Clinic in 5–7 days for further evaluation

**ASSESSMENT**

**Full Neurological Exam**

Without removing the c-collar, perform a full neurological exam including:

- Evaluation of sensation and strength to all extremities
- Eye exam: pupils and extraocular muscles
- Cranial nerves exam

If any part of the neurological exam is abnormal, keep c-collar in place and refer the patient to the Cincinnati Children’s Emergency Department—main campus.

**Perform Full Concussion Symptom Assessment**

**C-Spine Assessment**

Remove the c-collar. Perform full-spine midline palpation assessing for:

- Midline, paraspinal and lateral neck tenderness
- Ability to perform range of motion of neck with lateral rotation and full flexion/extension

(Lateral neck tenderness alone does not qualify as cervical spine tenderness.)

**MANAGEMENT/TREATMENT**

If no cervical spine tenderness with midline palpation and full ROM without pain or limitation, clear c-collar.

If persistent midline cervical tenderness and inability to perform full ROM due to pain, replace c-collar and follow up in 1 week.

**Indications for additional C-spine X-rays**

- If midline cervical tenderness is present, but the patient can perform full flexion/extension (even if pain is present), replace c-collar and send patient for flexion/extension C-spine X-rays.
  - In order:
    - Request an assessment for ligamentous injury/stability.
    - X-ray order comments must state that the patient is cleared to remove the c-collar and perform full ROM for X-ray. C-collar should be replaced after X-ray.
    - If X-rays show adequate flexion/extension and no signs of instability, clear c-collar.
    - If X-rays show inadequate flexion/extension, patient should remain in c-collar 24/7 and follow-up with PCP in 1 week for a repeat exam.

**Indications for cervical spine MRI without contrast**

- If unable to clear c-collar either clinically or with flexion/extension X-rays after two follow-up visits, order cervical spine MRI without contrast.
  - If there are findings of injury, instability or retro/anteriolisthesis, patient should remain in the c-collar 24/7 and refer to neurosurgery.

For more information, contact the Cincinnati Children’s Trauma Clinic at 513-636-8556.

**FAST FACTS**

- ~2% of children admitted to the hospital for traumatic injuries have pediatric cervical spine injuries
- high-risk mechanism for C-spine injury include axial load, diving injury, “clothes-lining,” child physical abuse and high-risk motor vehicle collision

**WHEN TO REFER TO TRAUMA CLINIC**

If concerned about clearance of cervical spine or other issues upon evaluation, please refer patient to Cincinnati Children’s Trauma Clinic at 513-636-8556.

**URGENT REFERRALS**

With urgent concerns, please contact the Trauma team.

- Monday—Friday business hours: Page the trauma nurse practitioner at 513-736-2082.
- After hours and weekends: Call Physician Priority Line and ask to speak with the PPL pediatric surgeon on call.

---

If you would like additional copies of this tool, or would like more information, please contact the Physician Outreach and Engagement team at Cincinnati Children’s.
Cervical Spine Clearance

Inclusion Criteria
Patients who were evaluated at a Cincinnati Children’s emergency department or urgent care center with concern for neck injury and:

- Had midline cervical tenderness and/or pain with ROM
- Had negative cervical spine X-rays
- Were discharged home in a cervical collar (c-collar) due to ongoing cervical spine tenderness and/or pain with range of motion
- Were instructed to wear the c-collar 24/7 and follow-up with their PCP or Cincinnati Children’s Trauma Clinic in 5–7 days for further evaluation

Patient Presents

Standard Workup

- Without removing c-collar, perform full neurological exam.
- Assess cranial nerves, pupils and EOMs, and sensation and strength to all extremities.
- Perform concussion symptom assessment

If any part of the neurological exam is abnormal, keep c-collar in place and refer to Cincinnati Children’s ED-Main Campus.

If neurological exam is normal, remove the c-collar.

Perform full spine midline palpation assessing for midline, paraspinal and lateral neck tenderness. Assess ability to perform ROM of neck with lateral rotation and full flexion/extension. Lateral neck tenderness alone does not qualify as cervical spine tenderness.

If no cervical tenderness and able to perform full ROM without limitation or midline pain
Clear c-collar. Patient can start normal ROM and stretches and slow return to activities (if no concussion).

If persistent midline cervical tenderness and inability to perform full ROM due to pain
Replace c-collar and follow up in 1 week

If midline cervical spine tenderness and/or midline pain upon ROM
Replace c-collar. Order flexion/extension cervical X-rays to assess for ligamentous injury/stability. State in order comments:
- C-collar may be removed for X-ray and replaced afterward
- Encourage full ROM

X-rays with adequate flexion/extension and no signs of instability
Clear c-collar

X-rays with inadequate flexion/extension
Remain in c-collar 24/7 and return in 1 week for repeat exam (start from top again)

Indications for cervical spine MRI w/o contrast

- If unable to clear c-collar either clinically or with flexion/extension X-rays after two follow-up visits
- If X-rays indicate instability or retro/anterolisthesis
  Remain in c-collar 24/7

MRI normal:
Clear c-collar

MRI with injury findings:
Remain in c-collar 24/7 and refer to neurosurgery (513-636-4726)

For urgent issues, or to speak with the specialist on call 24/7, call the Physician Priority Link® at 1-888-987-7997.