

Straightening Out the Facts: Navigating the path to pediatric cervical spine evaluation

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INTRODUCTION

- Evidence supports protocolization of cervical spine clearance in pediatric patients to hasten injury identification, limit radiation exposure and shorten time to cervical collar removal.
- Equally important is ensuring proper fit and function of the collar.
- Our trauma center noted improperly fitting collars and divergent practices of cervical spine evaluation among providers.
- A quality and patient safety initiative was undertaken to protocolize pediatric cervical collar management and the cervical spine clearance process.

MATERIALS & METHODS

- This project occurred in an academic Level 1 pediatric and adult trauma program from 2021-2023.
- Published trauma protocols were reviewed. Protocols were vetted against local contextual elements for potential for success, failure, and cost. The proposed clearance algorithm was presented to a wider body of stakeholders and edited based on institutional expert opinion and additional literature. Ultimately the new protocol was approved by an interdisciplinary group of physicians and nurses (Fig 1).
- Extensive education regarding collar fit and the adopted protocol were performed with nurses, physicians and ancillary staff.
- Safeguards including templated pediatric trauma notes with mandatory assessment of the cervical collar, mandatory orders within the admission order set and triggers to consult experts to re-assess collar fit were incorporated into the trauma admission process.
- Quantitative assessment of compliance occurs through chart review and qualitative review through user feedback.

RESULTS

- The cervical spine clearance protocol (Fig 1) was posted to a universally accessible trauma website and communication application for ease of access.

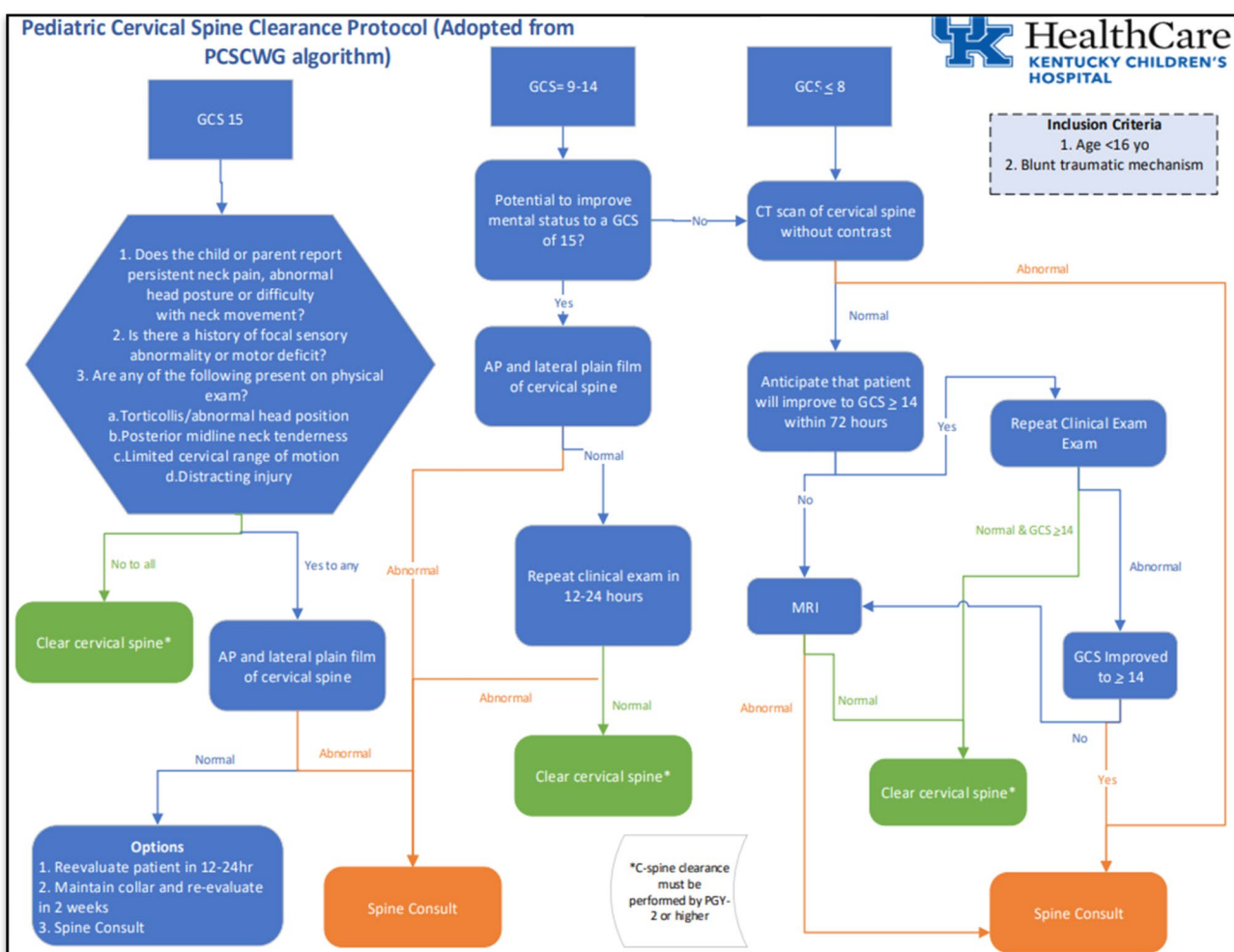


Fig 1. Cervical Spine Clearance Protocol

- Nurses, physicians and physical therapists completed education and simulation regarding proper cervical collar sizing, fit and application with the guidance of a trained group of "superusers."
- Documentation was added to the pediatric trauma history and physical (H&P) note upon admission to prompt assessment of proper collar fit (Fig. 2).

GCS:
Eyes: {NUMBER 1-4:22021}
Verbal: {Number1-5T:21255}
Motor: {NUMBERS; 1-6:10304}
Total: ***
Cervical Collar in Place: {yes no:314532}
Cervical Collar fit confirmed appropriate: {YES:21218}

Figure 2. Excerpt from templated pediatric trauma H&P

- The trauma admission order set was adjusted to include a mandatory order for whether or not a cervical collar was needed. If needed, this order, triggered a consult to physical and occupational therapy (PT/OT) to assess collar fit (Figs 3, 4).

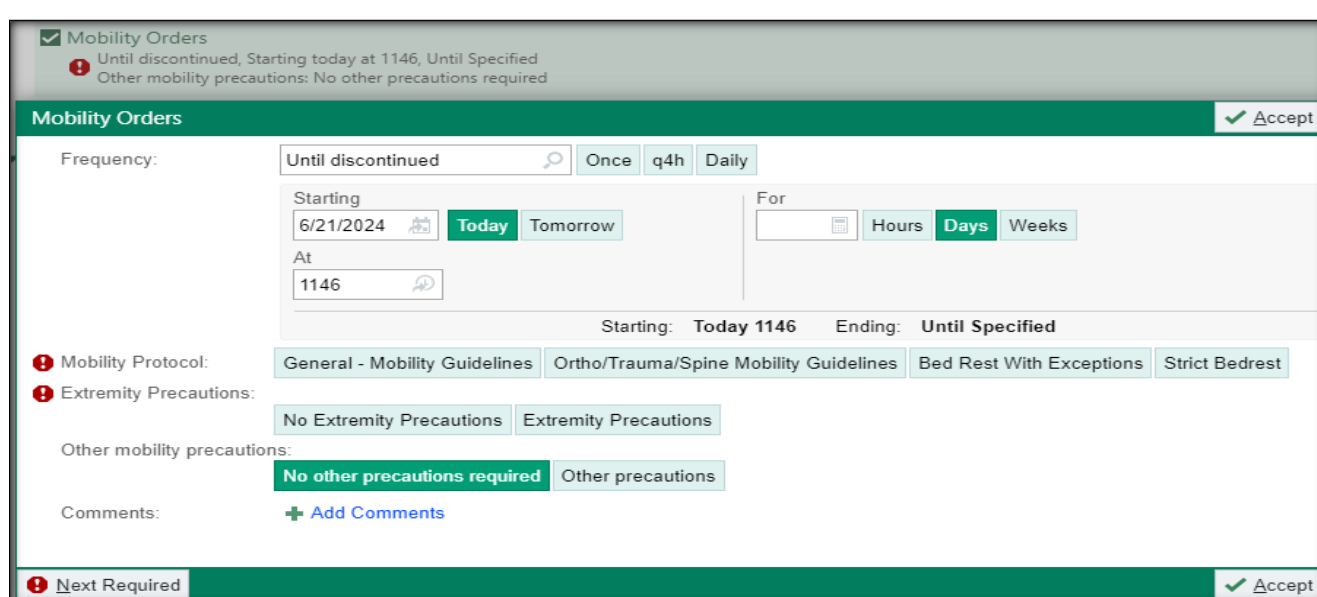


Fig 3. Mandatory order in trauma admission order set

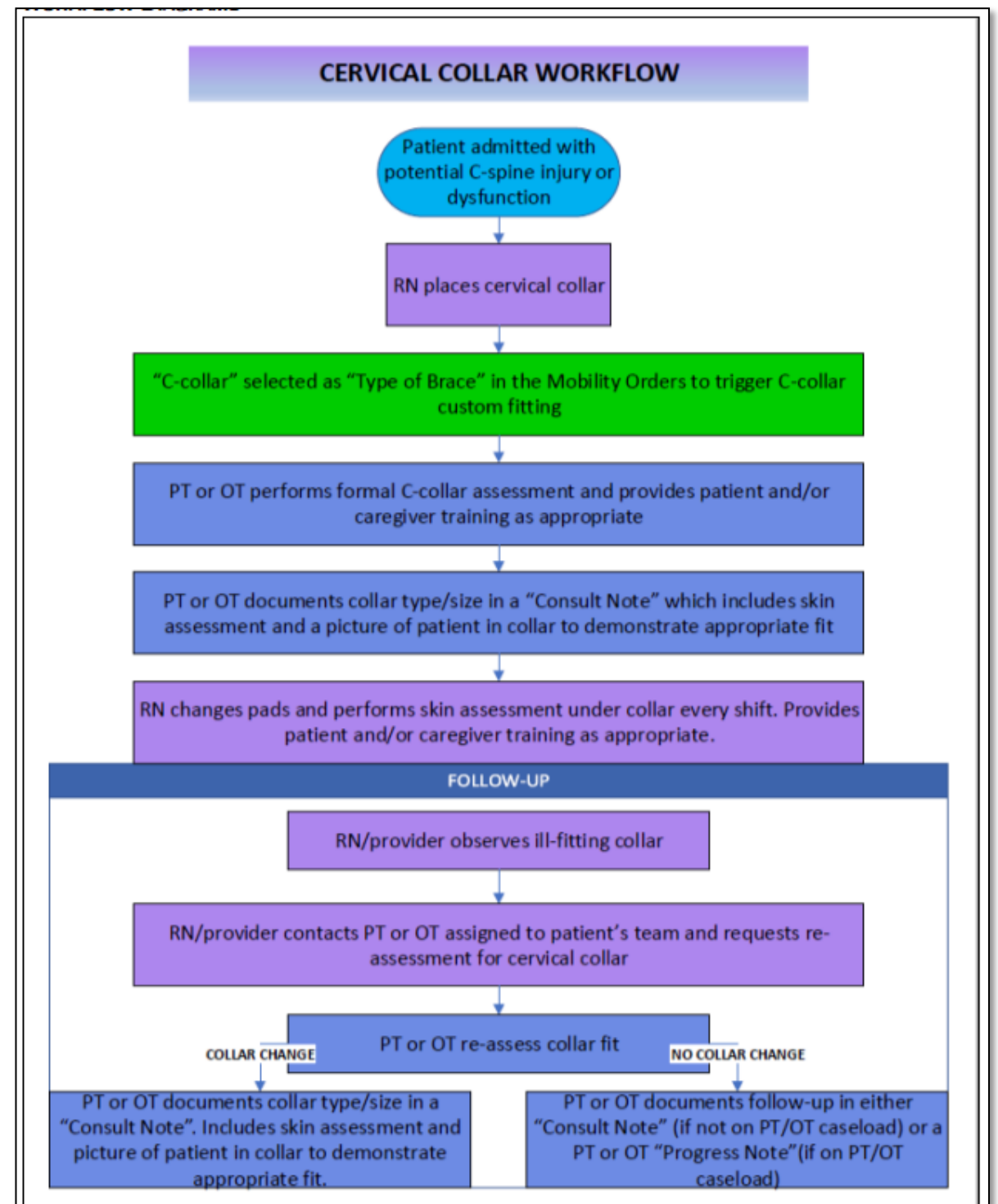


Fig 4. Workflow to ensure proper cervical spine collar fit

C-Spine Clearance Note

Date of C-spine Clearance: @TODAYDATE@
Time of C-spine Clearance: @NOW@
C-spine Cleared by: ***
Bedside Nurse Informed of C-spine Clearance: {yes/no:28786}
Name of RN Notified: ***
Time of Notification: ***
Orders Placed: {YES (DEF)/NO:29038}
At the time of cervical spine clearance:
1. Is patient GCS 15? {yes/no:28786}
2. Does the child or parent report persistent neck pain, abnormal head posture or difficulty with neck movement? {yes/no:28786}
3. Is there a history of focal sensory abnormality or motor deficit? {yes/no:28786}
4. Are any of the following present on physical exam?
a. Torticollis/abnormal head position: {yes/no:28786}
b. Posterior midline neck tenderness: {yes/no:28786}
c. Limited cervical range of motion: {yes/no:28786}
d. Distracting injury: {yes/no:28786}
5. If GCS <15 or "yes" to any of the above, please describe method in which cervical collar was cleared: ***

Fig 5. Templated cervical spine clearance note

- An internal communication channel was created for communication among pediatric trauma team members regarding issues with ill-fitting cervical collars and inappropriate removal of collars (Fig 6). Individual cases were reviewed weekly by the trauma medical director and feedback was provided to involved parties
- Continuing education regarding cervical collars was added to the nursing and resident onboarding processes.

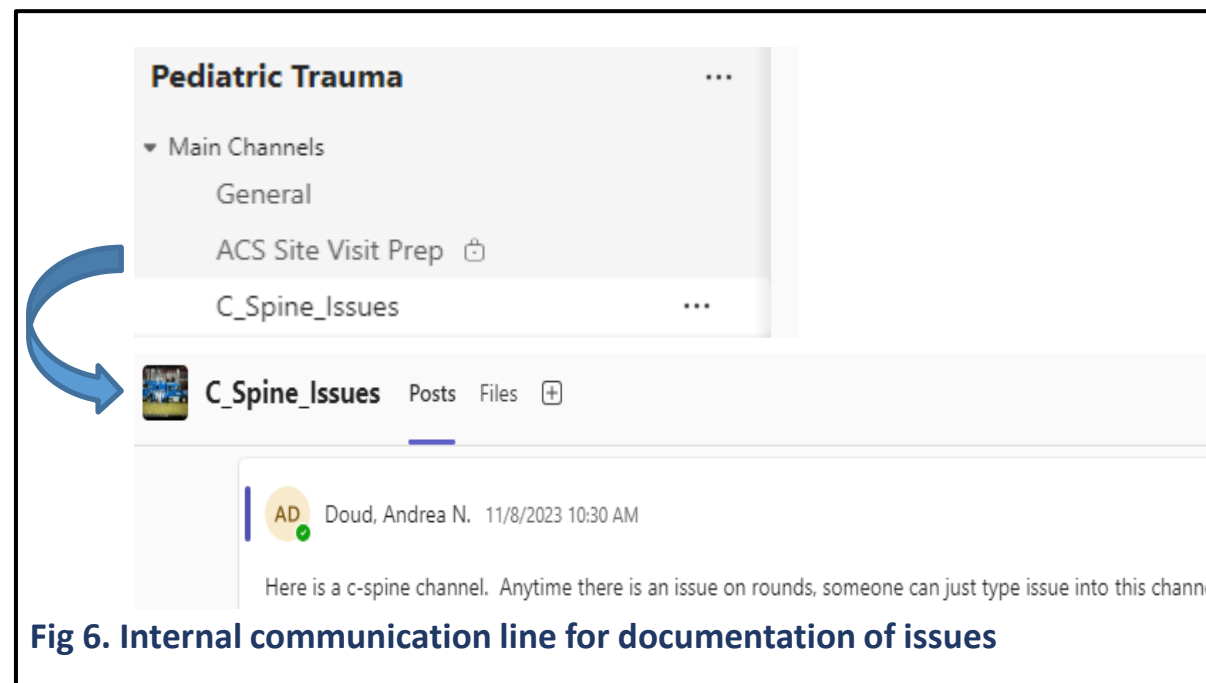


Fig 6. Internal communication line for documentation of issues

CONCLUSIONS

- This multifaceted c-spine pathway can provide a template for other institutions to successfully update, revise and implement safe pediatric cervical spine management and clearance protocols.
- Future directions include systematic chart review evaluating utilization of the tools in place, complication rates of ill-fitting collars and missed cervical spine injuries before and after implementation of this pathway.