Implementation of Pediatric Cervical Spine Clearance Pathway – Initial Results

Natalie Luehmann, MD; Jennifer Cirino, MD; Begum Akay, MD Department of Pediatric Surgery • Beaumont Hospital - Royal Oak, Michigan

BACKGROUND

Pediatric cervical spine (c-spine) injuries are rare events with potentially devastating consequences. Injuries cannot be missed, but patients at low risk for injury should not be subject to unnecessary radiation exposure early in their lives. An established algorithm for c-spine evaluation can help balance these conflicting ideals in clinical decision-making.

OBJECTIVE

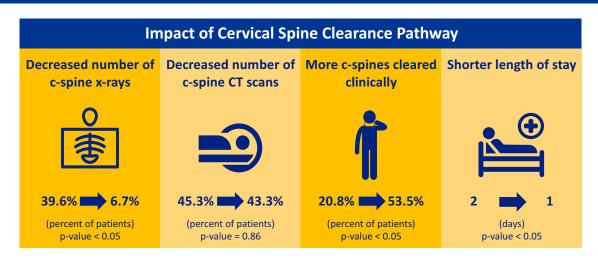
- Determine c-spine imaging rates before and after implementation of a standardized c-spine clearance pathway.
- Identify the number of missed c-spine injuries, patients cleared clinically, and length of hospital stay.

METHODS

- A multi-disciplinary physician group reviewed relevant current literature to develop an algorithm to guide c-spine clearance in the pediatric trauma population (age ≤ 12 years old).
- Patient charts 6 months before and 6 months after the implementation
 of our protocol to evaluate imaging rates, length of hospital stay, and to
 determine if there were any readmissions for missed injuries.

RESULTS

- Total 83 patients, 53 pre-protocol and 30 post-protocol implementation
- Post-protocol implementation group
- Fewer c-spine radiographs (6.7% vs 39.6%, p-value < 0.05)
- More c-spines cleared clinically (53.3% vs 20.8%, p-value < 0.05)
- Trend towards fewer computed tomography scans (45.3% vs. 43.3%, p-value = 0.86)
- Shorter length of stay (1 vs. 2 days, p-value < 0.05)
- No missed injuries identified despite higher injury severity scores (average ISS 9.5 vs 4.0, p-value < 0.05)



CONCLUSIONS

Use of a standardized c-spine clearance pathway decreases unnecessary radiation exposure and allows more patients' c-spines to be cleared clinically without compromising patient care. Thus far, our data suggests that a c-spine clearance pathway is paramount to ensuring that patients are evaluated appropriately and adequately with regard to c-spine injuries.

REFERENCES

- 1. Cervical collar by Gan Khoon Lay from the Noun Project
- 2. CT scan by Vectors Market from the Noun Project
- 3. Easter JS, Barkin R, Rosen CL, Ban K. Cervical spine injuries in children, part I: mechanism of injury, clinical presentation, and imaging. *J Emerg Med*. 2011;41:142-150.
- Easter JS, Barkin R, Rosen CL, Ban K. Cervical spine injuries in children, part II: management and special considerations. J Emerg Med. 2011;41:252-256.
- Kokoska ER, Keller MS, Rallo MC, Weber TR. Characteristics of pediatric cervical spine injuries. J Pediatr Surg. 2001;36:100-105.
- Lee SL, Sena M, Greenholz SK, Fledderman M. A multidisciplinary approach to the development of a cervical spine clearance protocol: process, rationale, and initial results. J Pediatr Surg. 2003;38:358-362; discussion 358-362.
 Medical care by Arafat Uddin from the Noun Project
- Nedical care by Arafat Oddin from the Nour
 Radiology by LAFS from the Noun Project
- 9. Rosati SF, Maarouf R, Wolfe L, et al. Implementation of pediatric cervical spine clearance guidelines at a combined trauma center: Twelve-month impact. *J Trauma Acute Care Surg*. 2015;78:1117-1121.