UCSF Department of Surgery

Cervical Collar-Associated Pressure Injury in Pediatric Trauma Patients

A Western Pediatric Surgery Research Consortium Study

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UCSF Department of Surgery

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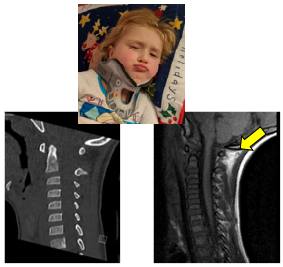
Cervical Spine Immobilization in Injured Children

- Cervical spine injury is rare (1-2% of pediatric trauma)
- Cervical spine immobilization is commonly used in injured children:
  - Unable to clinically clear the c-spine due to age or obtunded patient
  - Clinically unstable cervical spine injuries can occur in the absence of fracture due to ligament injury



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Cervical Hospital Associated Pressure Ulcers (HAPI)

- Stage 3 or 4 HAPI acquired after admission are “Never Events” per AHRQ
- Most HAPI are associated with medical devices or occur in critically injured patients

PSNet PATIENT SAFETY NETWORK

AHRQ Agency for Healthcare Research and Quality

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HAPI in Injured Children

- HAPI rates for **all body regions** in hospitalized children range from 1.4% (all hospitalized children) to 35% (ICU)
- Cervical spine immobilization associated with 6-38% HAPI rates in **adult** trauma patients
- Unknown rate of HAPI related to cervical spine immobilization in children

Glasgow et al. J Wound Care 2014.

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Study Aims

- Determine the frequency of cervical HAPI in the pediatric trauma population
- Determine the risk factors and time course of Cervical HAPI

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Methods

- Retrospective cohort study of five years (2017-2021) including all children admitted with a traumatic injury and found to have a stage two or greater cervical HAPI
  - Cervical HAPI: occipital, mandibular or clavicular/posterior neck

Children's Hospital Los Angeles – We Treat Kids Better
Children's Hospital Colorado
Stanford Medicine
Children's Medical Center
Rady Children's Hospital San Diego
49,218
Pediatric Trauma Patients
Oregon Health & Science University
Seattle Children's
Intermountain Primary Children's Hospital
UCSF Benioff Children's Hospitals

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Results

- 32 children (0.06%) with stage two or greater cervical HAPI
- Median age was 5 years (IQR 2-13)
- Median time to diagnosis was 11 days after injury (IQR 7-21)

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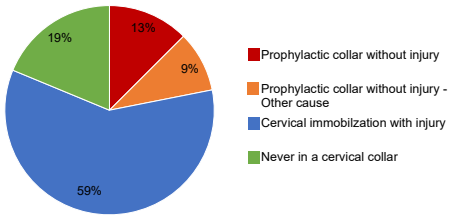
Results

Causes of Cervical HAPI in Injured Children



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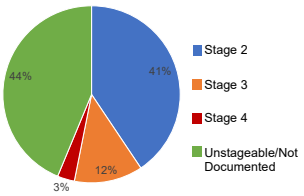
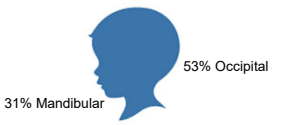
Results

Cervical HAPI Stage at Diagnosis





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Results

Age	Mechanism of Injury	Vent Days	Attributed Cause of HAPI	Craniotomy or ICP Monitor	Day Ulcer Found	Ulcer Stage	Day Collar Removed	MRI Day Post-Injury
4y	MVC	11	Cervical Collar	ICP Monitor & Craniotomy	5	2	6	4
5mo	Fall	4	Cervical Collar	None	4	2	4	3
2y	Child Physical Abuse	8	Cervical Collar	None	7	3	7	4
17y	Bicycle Collision	9	Cervical Collar	ICP Monitor	12	Unstageable	7	7
13y	Assault	7	Facial Bandage	None	41	2	8	7
10y	MVC	6	Endotracheal Tube Strap	None	12	2	3	3
1y	Child Physical Abuse	7	ICP Monitor Bandage	ICP Monitor	5	2	3	No MRI

Four children developed HAPI after wearing a prophylactic cervical collar in the absence of a cervical spine injury.

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Conclusion

- Cervical HAPI in injured children is rare.
  - Most commonly caused by necessary immobilization devices
- Expedient cervical spine clearance with MRI ≤ 72 hours after injury is unlikely to reduce cervical HAPI caused by prophylactic cervical collars.

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Thank You Contributors

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Resources

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