



JTACS SEPTEMBER TABLE OF CONTENTS

'BEST OF' SEPTEMBER ARTICLES

BEST OF TRAUMA ARTICLE





Pediatric Cervical Spine Clearance: A 10-year Evaluation of Multi-Detector Computed Tomography at a Level 1 Pediatric Trauma Center		
Techniques for Pediatric Cervical Spine Clearance are Variable	In 4,477 Children MDCT 100% Sensitive Detection of Clinically Significant Pediatric Cervical Spine Injury	 MRI May Be Unnecessary if MDCT Negative
		
<small>Russel KW et al. Journal of Trauma and Acute Care Surgery. DOI: 10.1097/TA.0000000000003929 @JTraumAcuteSurg Copyright © 2023 Wolters Kluwer Health, Inc. All rights reserved.</small>		

PEDIATRIC CERVICAL SPINE CLEARANCE: A 10-YEAR EVALUATION OF MULTI-DETECTOR COMPUTED TOMOGRAPHY AT A LEVEL 1 PEDIATRIC TRAUMA CENTER
[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/PEDIATRIC_CERVICAL_SPINE_CLEARANCE_A_10_YEAR.10.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/pediatric_cervical_spine_clearance_a_10_year.10.aspx)



SCAN HERE TO VIEW A VIDEO OVERVIEW OF THE ARTICLE

<https://qr.page/g/1sOn1He6euu>

Pharmacologic TLR4 Inhibition Skews Toward a Favorable A1/A2 Astrocytic Ratio Improving Neurocognitive Outcomes following Traumatic Brain Injury		
TLR4 Inhibition in a TBI Mouse Model	Acute Changes ↓ A1 Proinflammatory markers ↓ A2 Anti-inflammatory markers Chronic Changes ↓ A1 Proinflammatory markers ↓ A2 Anti-inflammatory markers	  Myelin Regeneration  Improved Behavioral Outcomes
		
<small>El Baassiri MG and Rahal SS et al. Journal of Trauma and Acute Care Surgery. DOI: 10.1097/TA.0000000000003587 @JTraumAcuteSurg Copyright © 2023 Wolters Kluwer Health, Inc. All rights reserved.</small>		


PHARMACOLOGIC TLR4 INHIBITION SKEWS TOWARD A FAVORABLE A1/A2 ASTROCYTIC RATIO IMPROVING NEUROCOGNITIVE OUTCOMES FOLLOWING TRAUMATIC BRAIN INJURY
[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/PHARMACOLOGIC_TOLL LIKE RECEPTOR_4_INHIBITION.T1.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/pharmacologic_toll_like_receptor_4_inhibition.t1.aspx)



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BEST OF SCC ARTICLE

Impact of Thromboprophylaxis Guidelines for Injured Kids		
Retrospective review of 10 pediatric trauma centers	Guidelines' Effect ↓ Reduced Overall VTE Rate ← No Change When Normalized to PICU ↓ Reduced Overall Chemoprophylaxis ↑ Increased "Targeted" Chemoprophylaxis Sensitivity of Guidelines: 43% Adherence rate (in those who developed VTE): 8%	Guidelines are potentially beneficial but loosely adhered to and lack fidelity Further Prospective study and refinement of guidelines are needed
Thromboprophylaxis Guidelines? Yes 3 Centers N=28,359 No 7 Centers N=16,843 <small>VTE = venous thromboembolism</small>		
<small>Labuz DF et al. Journal of Trauma and Acute Care Surgery. DOI: 10.1097/TA.0000000000003918 @JTraumAcuteSurg Copyright © 2023 Wolters Kluwer Health, Inc. All rights reserved.</small>		

IMPACT OF INSTITUTIONAL PROPHYLAXIS GUIDELINES ON PEDIATRIC VENOUS THROMBOEMBOLISM RATES FOLLOWING TRAUMA – A MULTICENTER STUDY FROM THE PEDIATRIC TRAUMA SOCIETY RESEARCH COMMITTEE
[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/IMPACT_OF_INSTITUTIONAL_PROPHYLAXIS_GUIDELINES_ON.8.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/impact_of_institutional_prophylaxis_guidelines_on.8.aspx)

BEST OF BASIC SCIENCES ARTICLE

INSTITUTIONAL OUTCOMES OF BLUNT LIVER & SPLENIC INJURY IN THE ATOMAC ERA

Retrospective cohort study of patients <18 years with blunt splenic and/or liver injury

- Length of hospital stay the same regardless of injury grade - 1.2 days
- No complications of nonoperative management
- Splenic salvage 100%
- Operative intervention 1.5%

Management based on injury grade?

Management based on hemodynamic status alone!

N=199

Stewart S et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003870
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The Journal of Trauma and Acute Care Surgery

INSTITUTIONAL OUTCOMES OF BLUNT LIVER & SPLENIC INJURY IN THE ATOMAC ERA

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/INSTITUTIONAL_OUTCOMES_OF_BLUNT_LIVER_AND_SPLENIC.1.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/institutional_outcomes_of_blunt_liver_and_splenic.1.aspx)

Association of Blood Product Ratios with Early Mortality in Pediatric Trauma Resuscitation: A Time-Dependent Analysis from the National Trauma Databank

Severe hemorrhage → balanced blood product resuscitation

TQIP, 2017-2019, <18 yrs old

N=1152, 28% severe TBI, 18% died by 24 hrs

Product ratios increased over time, and individual patients switched ratio groups up to 6 times

No significant association of early mortality with blood product ratio group on time-dependent analysis

Timing matters! Prospective study needed

Unanswered questions in kids:

- Timing of individual blood products?
- Do product ratios change over time?
- What is relationship of high ratios to mortality when time-varying factors considered?

>40 cc/kg or >2 units PRBC/whole blood within 1st 4 hours

Timing of each individual transfusion event recorded

Time-dependent Cox model for association of blood product ratio with 24-hour mortality

Snyder CW et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003905
@JTraumaAcuteSurg

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ASSOCIATION OF BLOOD PRODUCT RATIOS WITH EARLY MORTALITY IN PEDIATRIC TRAUMA RESUSCITATION: A TIME-DEPENDENT ANALYSIS FROM THE NATIONAL TRAUMA DATABANK

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/ASSOCIATION_OF_BLOOD_PRODUCT_RATIOS_WITH_EARLY.5.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/association_of_blood_product_ratios_with_early.5.aspx)

Continuous Noninvasive Hb in Pediatric Solid Organ Injury

39 pediatric trauma patients admitted with SOI

19 Liver 5 Pelvic Fracture
25 Spleen 12 Kidney

Noninvasive Hb (SpHb) monitor placed

Matched with Hb levels from blood draws

Mean Lab Hb: 10.6 g/dL
Mean SpHb: 10.6 g/dL

Wide limits of agreement

Readings affected by:

- Injury Severity (↑ ISS)
- Shock (↑ SIPA)
- Skin pigment (Race)

Ryan ML et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003926
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UTILITY OF CONTINUOUS PULSE CO-OXIMETRY FOR HEMOGLOBIN MONITORING IN PEDIATRIC PATIENTS WITH SOLID ORGAN INJURIES AT LEVEL 1 TRAUMA CENTERS: A PILOT STUDY

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/UTILITY_OF_CONTINUOUS_PULSE_CO_OXIMETRY_FOR.2.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/utility_of_continuous_pulse_co_oximetry_for.2.aspx)

Diagnostic accuracy of screening tools for pediatric blunt cerebrovascular injury: An ATOMAC multicenter study

Which of the current BCVI screening tools is most sensitive in pediatrics?

Multicenter, age < 15, prospectively screened:

Results: 24 BCVI among 1461 children

Highest sensitivity: Memphis criteria, 91.7%

Highest specificity: Utah score, 95.8%, but misses >50% BCVI

A better pediatric BCVI screening tool is needed

Adult criteria: Memphis, Denver, EAST

Pediatric criteria: Utah score, McGovern score

Positive Memphis → CTA

All patients → 2-week follow up

Retrospectively applied additional screening criteria to measure diagnostic accuracy

Nickoles TA et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003888
@JTraumaAcuteSurg

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DIAGNOSTIC ACCURACY OF SCREENING TOOLS FOR PEDIATRIC BLUNT CEREBROVASCULAR INJURY: AN ATOMAC MULTICENTER STUDY

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/DIAGNOSTIC_ACCURACY_OF_SCREENING_TOOLS_FOR.6.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/diagnostic_accuracy_of_screening_tools_for.6.aspx)

Plasma Thrombin Generation Kinetics Vary by Injury Pattern and Resuscitation Characteristics in Pediatric and Young Adult Trauma Patients

Thrombin generation kinetics are not well understood in children and young adult trauma patients

How do thrombin generation kinetics vary by injury pattern and clinical characteristics in pediatric and young adult trauma patients?

Single Center prospective cohort study

47 pediatric trauma patients (0-17 years)

49 young adult trauma patients (18-21 years)

Plasma Thrombin Generation → CAT Assay

Increased Thrombin Generation:

- Young adults > pediatric
- Young adults with TBI

Accelerated Thrombin generation:

- Pediatric patients requiring surgery
- Pediatric & young adult patients requiring transfusion

LT: lag time (min)
tPeak: time to peak (min)
ETP: endogenous thrombin potential (nM*min)

MacArthur TA et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003901
@JTraumaAcuteSurg

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PLASMA THROMBIN GENERATION KINETICS VARY BY INJURY PATTERN AND RESUSCITATION CHARACTERISTICS IN PEDIATRIC AND YOUNG ADULT TRAUMA PATIENTS

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/PLASMA_THROMBIN_GENERATION_KINETICS_VARY_BY_INJURY.3.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/plasma_thrombin_generation_kinetics_vary_by_injury.3.aspx)

Lower incidence of blunt cerebrovascular injury among young, properly restrained children: An ATOMAC multicenter study

What is the incidence of blunt cerebrovascular injury (BCVI) among children in motor vehicle crashes?

Is restraint status associated with pediatric BCVI?

Multicenter, age < 15, prospectively screened:

Among age < 12:

- 0 BCVI – proper restraint
- 7 BCVI – improper restraint

Among age 12-15:

- 1 BCVI – unrestrained
- 2 BCVI – seatbelt only

Positive Memphis criteria → CTA

All patients → 2-week follow up

Analyzed patients of motor vehicle trauma by age and restraint status

*Underpowered for rates, odds, or significance

Nickoles TA et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003900
@JTraumaAcuteSurg

The Journal of Trauma and Acute Care Surgery

LOWER INCIDENCE OF BLUNT CEREBROVASCULAR INJURY AMONG YOUNG, PROPERLY RESTRAINED CHILDREN: AN ATOMAC MULTICENTER STUDY

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/LOWER_INCIDENCE_OF_BLUNT_CEREBROVASCULAR_INJURY.7.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/lower_incidence_of_blunt_cerebrovascular_injury.7.aspx)

Effects of Hypocalcemia in Severely Injured Pediatric Trauma Patients

Evidence supporting role of hypocalcemia in progressive shock

Ca²⁺ = 46.5%

Hypothermia

SIPA on Arrival

pH and lactate

No Difference

Lethal Diamond: JCa, Lethal Diamond, pH, Coagulopathy

Clarglia A et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003902
@JTraumaAcuteSurg

The Journal of Trauma and Acute Care Surgery

THE EFFECTS OF HYPOCALCEMIA IN SEVERELY INJURED PEDIATRIC TRAUMA PATIENTS

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/THE_EFFECTS_OF_HYPOCALCEMIA_IN_SEVERELY_INJURED.4.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/the_effects_of_hypocalcemia_in_severely_injured.4.aspx)

Use of Prehospital Reverse Shock Index Times Glasgow Coma Scale to Identify Children who Require the Most Immediate Trauma Care

1-18 year olds transferred from scene to level 1 pediatric trauma center

Children with an abnormal rSIG had higher rates of:

- Intubation: 28.8% vs 9.5%
- ICP Monitor: 9.2% vs 1.2%
- Blood Transfusion: 19.6% vs 8.3%
- Laparotomy: 8.0% vs 1.2%
- ICU Admission: 54.6% vs 40.5%

Abnormal rSIG cutoffs:

- 1-6 years ≤ 13.1
- 7-12 years ≤ 16.5
- 13-18 years ≤ 20.1

Abnormal prehospital rSIG is associated with need for higher levels of care

This tool may assist EMS providers with earlier identification and triage of severely injured children in the field

66% (163) abnormal prehospital rSIG

34% (84) normal prehospital rSIG

rSIG = (SBP/HR) * GCS

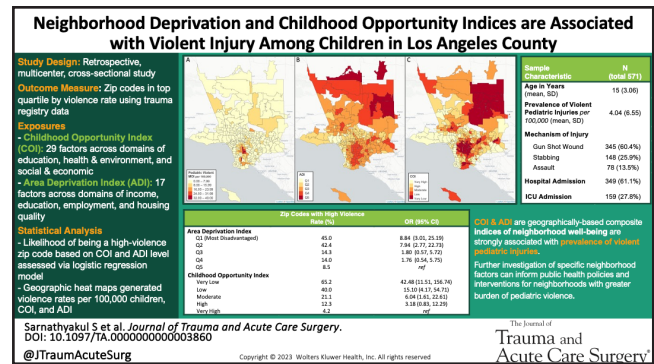
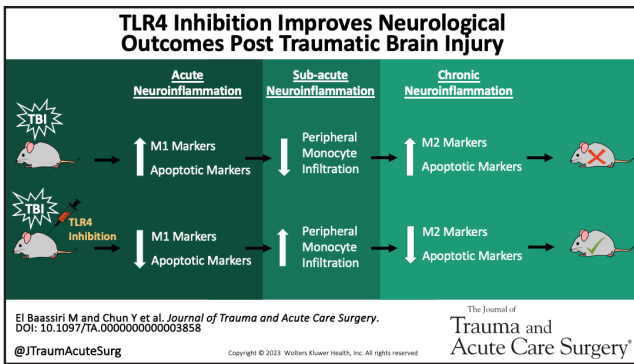
All differences statistically significant (p<0.05)

Reppucci ML et al. *Journal of Trauma and Acute Care Surgery*. DOI: 10.1097/TA.0000000000003903
@JTraumaAcuteSurg

The Journal of Trauma and Acute Care Surgery

USE OF PREHOSPITAL REVERSE SHOCK INDEX TIMES GLASGOW COMA SCALE TO IDENTIFY CHILDREN WHO REQUIRE THE MOST IMMEDIATE TRAUMA CARE

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/USE_OF_PREHOSPITAL_REVERSE_SHOCK_INDEX_TIMES.9.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/use_of_prehospital_reverse_shock_index_times.9.aspx)

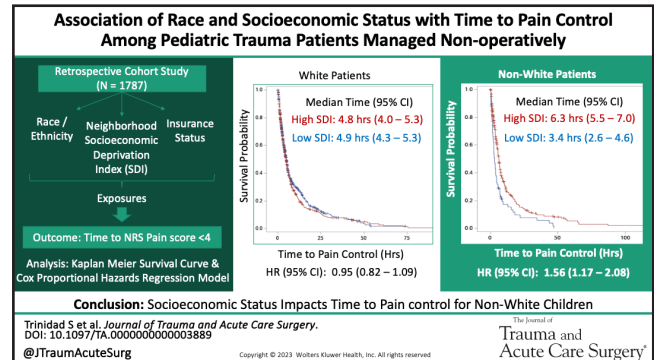
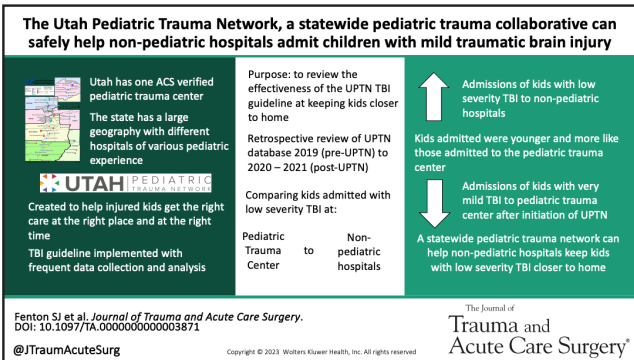


INFILTRATING ANTI-INFLAMMATORY MONOCYTES MODULATE MICROGLIAL ACTIVATION THROUGH TLR4-IFN DEPENDENT PATHWAYS FOLLOWING TRAUMATIC BRAIN INJURY

HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/INFILTRATING_ANTILN-FLAMMATORY_MONOCYTES_MODULATE.12.ASPX

NEIGHBORHOOD DEPRIVATION AND CHILDHOOD OPPORTUNITY INDICES ARE ASSOCIATED WITH VIOLENT INJURY AMONG CHILDREN IN LOS ANGELES COUNTY

HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/NEIGHBORHOOD-DEPRIVATION_AND_CHILDHOOD_OPPORTUNITY.16.ASPX

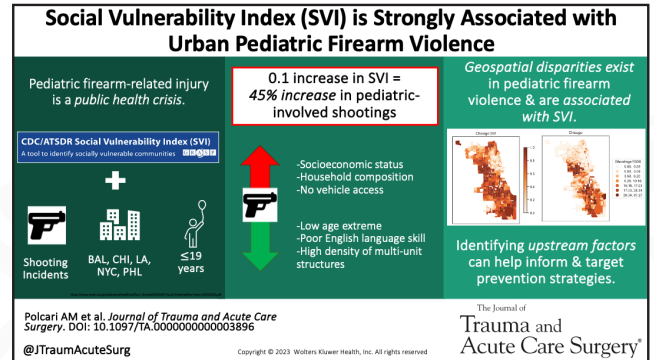
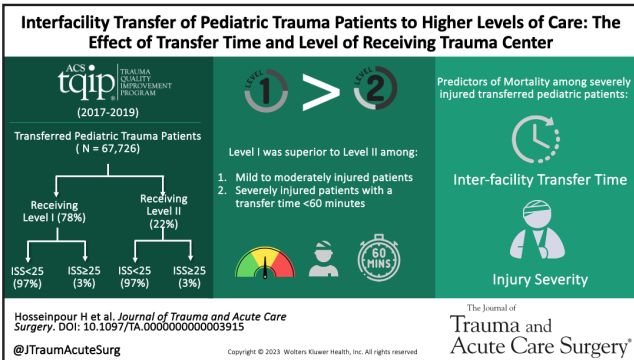


THE UTAH PEDIATRIC TRAUMA NETWORK, A STATEWIDE PEDIATRIC TRAUMA COLLABORATIVE CAN SAFELY HELP NON-PEDIATRIC HOSPITALS ADMIT CHILDREN WITH MILD TRAUMATIC BRAIN INJURY

HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/THE_UTAH_PEDIAT-TRIC_TRAUMA_NETWORK_A_STATEWIDE.13.ASPX

ASSOCIATION OF RACE AND SOCIOECONOMIC STATUS WITH TIME TO PAIN CONTROL AMONG PEDIATRIC TRAUMA PATIENTS MANAGED NON-OPERATIVELY

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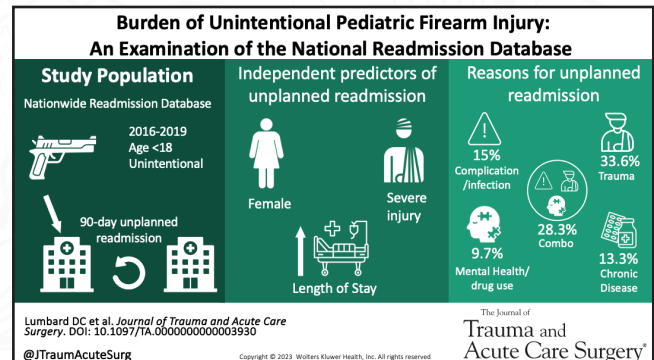
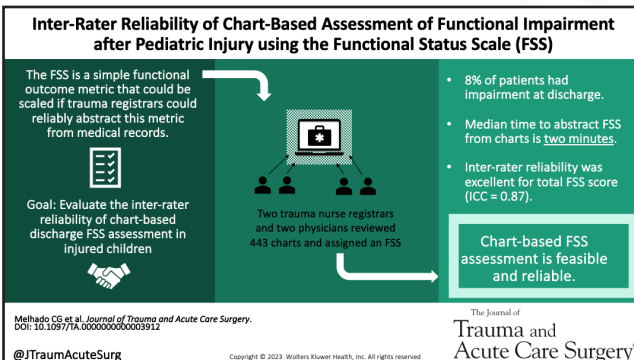


INTERFACILITY TRANSFER OF PEDIATRIC TRAUMA PATIENTS TO HIGHER LEVELS OF CARE: THE EFFECT OF TRANSFER TIME AND LEVEL OF RECEIVING TRAUMA CENTER

HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/INTERFACILITY-TRANSFER_OF_PEDIATRIC_TRAUMA.14.ASPX

SOCIAL VULNERABILITY INDEX IS STRONGLY ASSOCIATED WITH URBAN PEDIATRIC FIREARM VIOLENCE: AN ANALYSIS OF FIVE MAJOR U.S. CITIES

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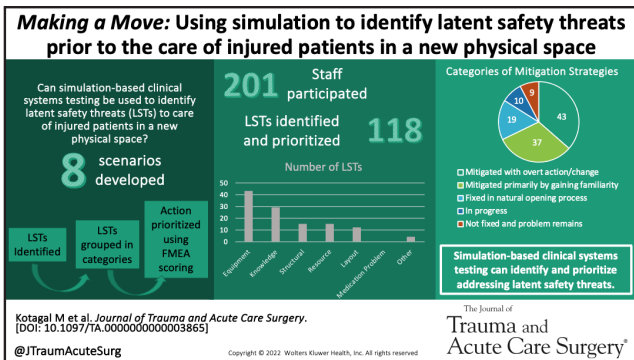


INTER-RATER RELIABILITY OF CHART-BASED ASSESSMENT OF FUNCTIONAL IMPAIRMENT AFTER PEDIATRIC INJURY USING THE FUNCTIONAL STATUS SCALE (FSS)

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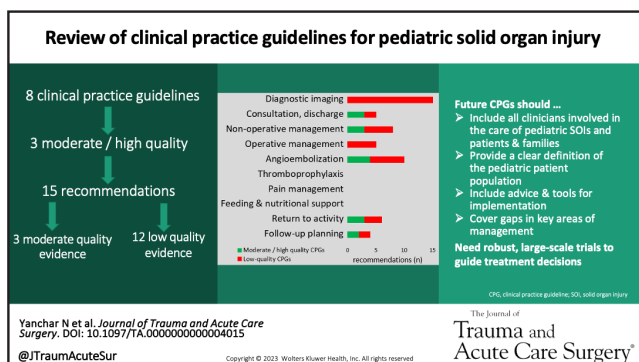
BURDEN OF UNINTENTIONAL PEDIATRIC FIREARM INJURY: AN EXAMINATION OF THE NATIONAL READMISSION DATABASE

HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/BURDEN_OF_UNIN-TENTIONAL_PEDIATRIC_FIREARM_INJURY.19.ASPX



MAKING A MOVE: USING SIMULATION TO IDENTIFY LATENT SAFETY THREATS PRIOR TO THE CARE OF INJURED PATIENTS IN A NEW PHYSICAL SPACE

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/MAKING_A_MOVE_USING_SIMULATION_TO_IDENTIFY_LATENT.20.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/making_a_move_using_simulation_to_identify_latent.20.aspx)



CLINICAL PRACTICE GUIDELINE RECOMMENDATIONS FOR PEDIATRIC SOLID ORGAN INJURY CARE: A SYSTEMATIC REVIEW

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/CLINICAL_PRACTICE_GUIDELINE_RECOMMENDATIONS_FOR.22.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/clinical_practice_guideline_recommendations_for.22.aspx)

NO VISUAL ABSTRACT PROVIDED

EMERGENCY DEPARTMENT THORACOTOMY IN CHILDREN: A PEDIATRIC TRAUMA SOCIETY (PTS), WESTERN TRAUMA ASSOCIATION (WTA), AND EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA (EAST) SYSTEMATIC REVIEW AND PRACTICE MANAGEMENT GUIDELINE

[HTTPS://JOURNALS.LWW.COM/JTRAUMA/FULLTEXT/2023/09000/EMERGENCY_DEPARTMENT_THORACOTOMY_IN_CHILDREN_A.21.ASPX](https://journals.lww.com/jtrauma/fulltext/2023/09000/emergency_department_thoracotomy_in_children_a.21.aspx)