



Impact of Deferring Prehospital Thoracostomy in Combat Casualties

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Disclosures

- Major Danielle Akler, MD has no conflict to report.
- This study was performed as part of the Israel Defense Forces Trauma and Combat Medicine Branch effort to improve the quality of combat casualty care and received no external funding or support.



About myself

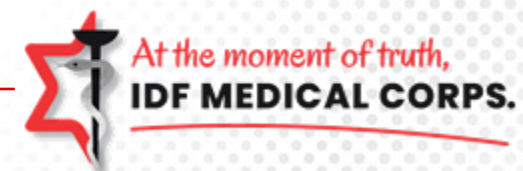
Medical doctor

Infantry battalion surgeon

Brigade surgeon during October 7th and the first year of the “Swords of Iron” War

Trauma and Combat Medicine Branch (TCMB) – IDF Medical Corps

ESEP officer – USAISR



Background

ORIGINAL ARTICLE

Death on the battlefield (2001–2011): Implications for the future of combat casualty care

Brian J. Eastridge, MD, Robert L. Mabry, MD, Peter Seguin, MD, Joyce Cantrell, MD, Terrill Tops, MD, Paul Uribe, MD, Olga Mallett, Tamara Zubko, Lynne Oetjen-Gerdes, Todd E. Rasmussen, MD, Frank K. Butler, MD, Russell S. Kotwal, MD, John B. Holcomb, MD, Charles Wade, PhD, Howard Champion, MD, Mimi Lawnick, Leon Moores, MD, and Lorne H. Blackbourne, MD

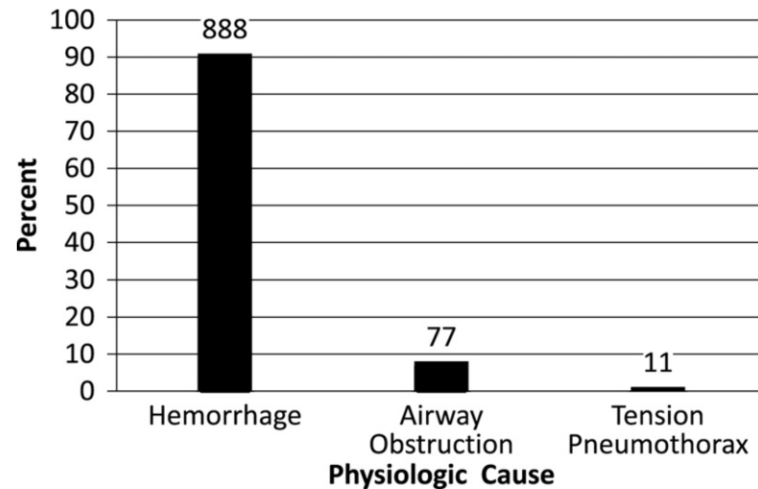


Figure 4. Injury/physiologic focus PS acute mortality (n = 976).

Surgical Innovation JAMA Surgery

May 17, 2023

Circulation First for the Rapidly Bleeding Trauma Patient—It Is Time to Reconsider the ABCs of Trauma Care

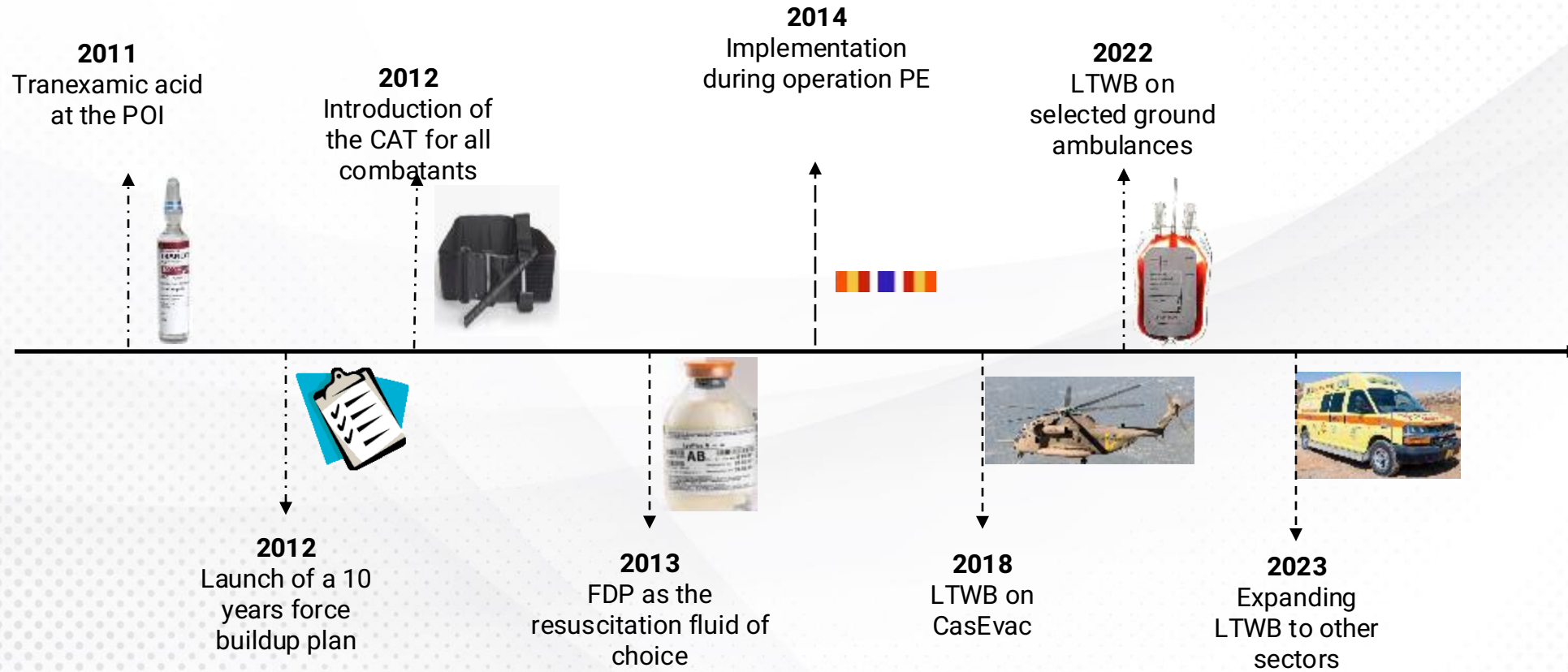
Paula Ferrada, MD^{1,2}; Sharmila Dissanaikie, MD³

» Author Affiliations

JAMA Surg. 2023;158(8):884-885. doi:10.1001/jamasurg.2022.8436

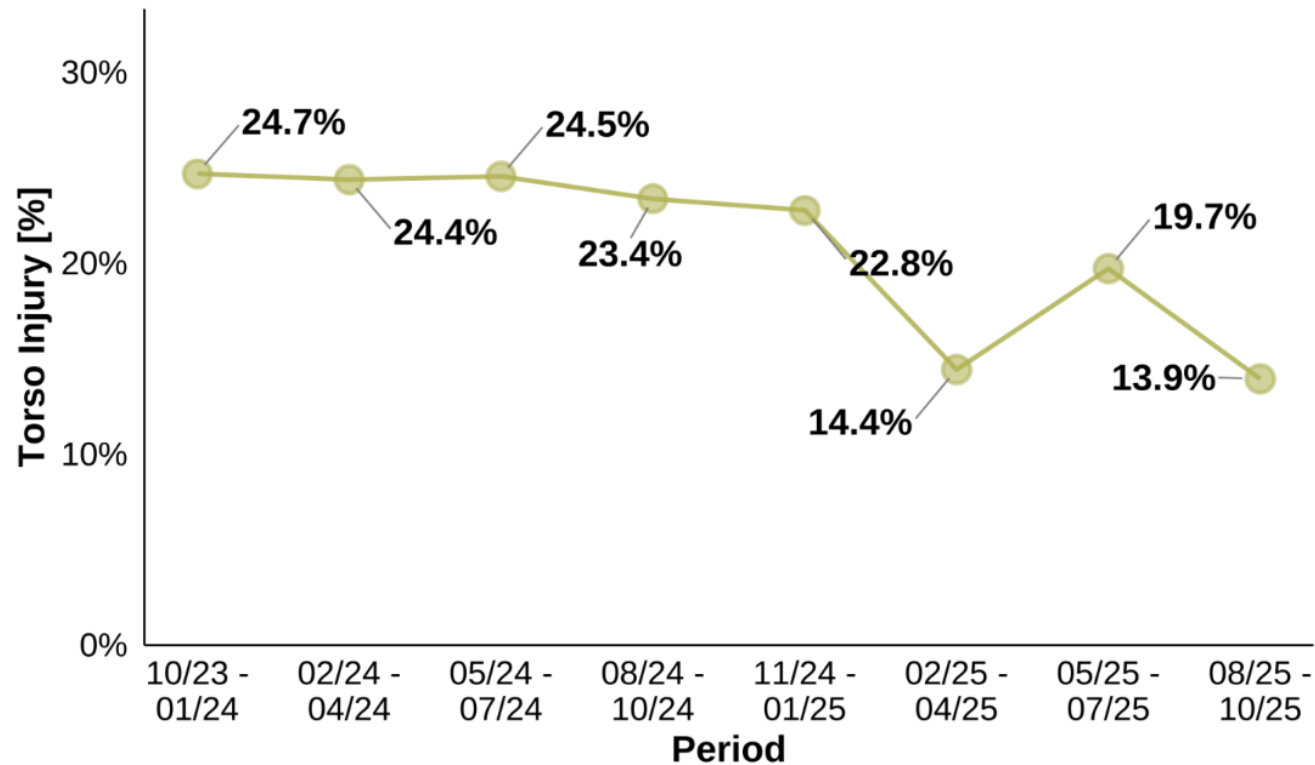
J Trauma Acute Care Surg
Volume 73, Number 6, Supplement 5

Background - IDF Medical Corps Timeline

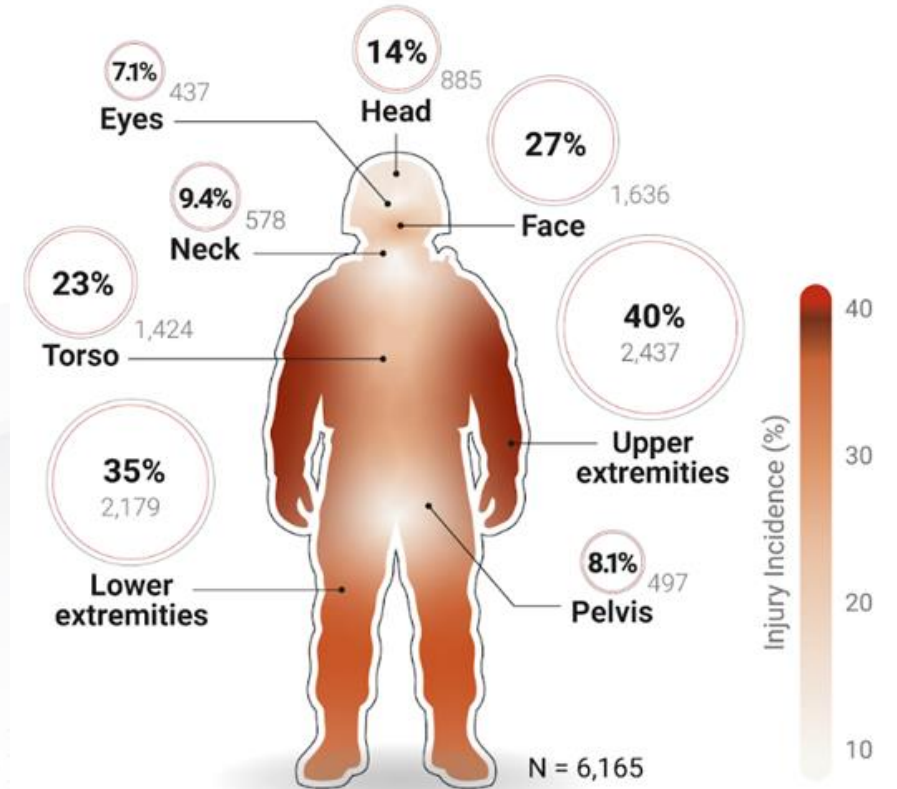


Background – Swords of Iron War

Torso Injury by Different Periods



Distribution by Body Region



Our previous CPG's

Focused on **aggressive invasive intervention**



Life saving procedures ?



Revision of The Thoracic Trauma Protocol

Key Finding

The intervention delayed **evacuation** and **Remote Damage Control Resuscitation**

Needle Thoracostomy

- No proven survival benefit
- Delays life-saving interventions
- Prolongs evacuation time
- Encourages premature procedural decision-making
- **25-50%** failure rate in reaching the pleural cavity
- Associated with a substantial rate of significant complications



Prior to April 2024

Liberal Approach

Evidence of chest trauma

Oxygen desaturation
(SpO₂<85%) not responding
to supplemental oxygen



Presence of shock

Needle thoracostomy
and volume resuscitation

No rapid
hemodynamic improvement



Tube thoracostomy

Revised in April 2024

Conservative Approach

Evidence of chest trauma

Positive pressure ventilation

Presence of shock

Volume resuscitation

Shock developed following
initiation of positive-
pressure ventilation and
No other source of bleeding and
Oxygen saturation ≤88%



Spontaneously breathing

Presence of shock

Volume resuscitation
Supplemental oxygen

Worsening respiratory distress and
Oxygen saturation ≤88% and
Two hours elapsed since injury



At the moment of truth,
IDF MEDICAL CORPS.

Our current CPG's

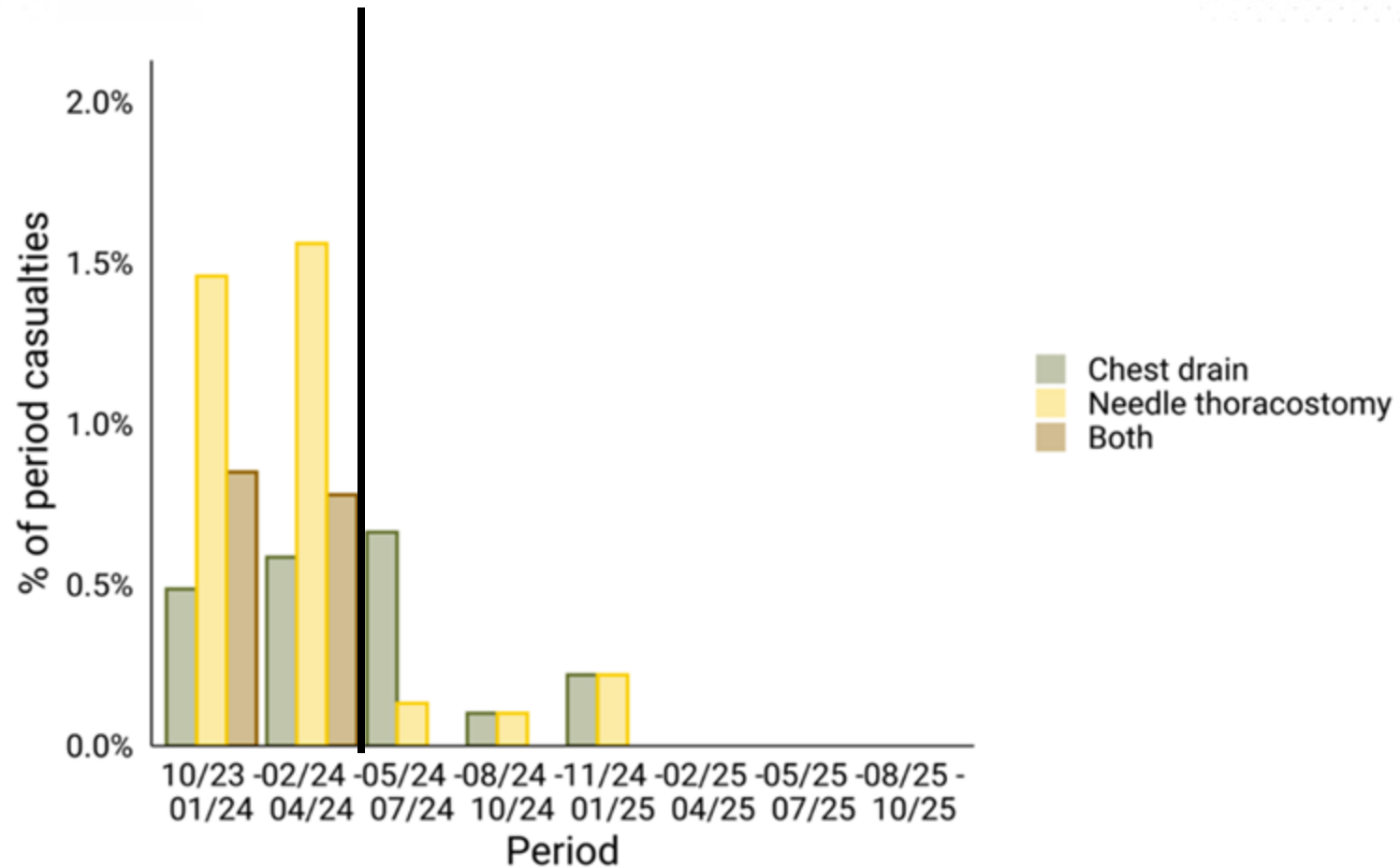
Focused on conservative **intervention**



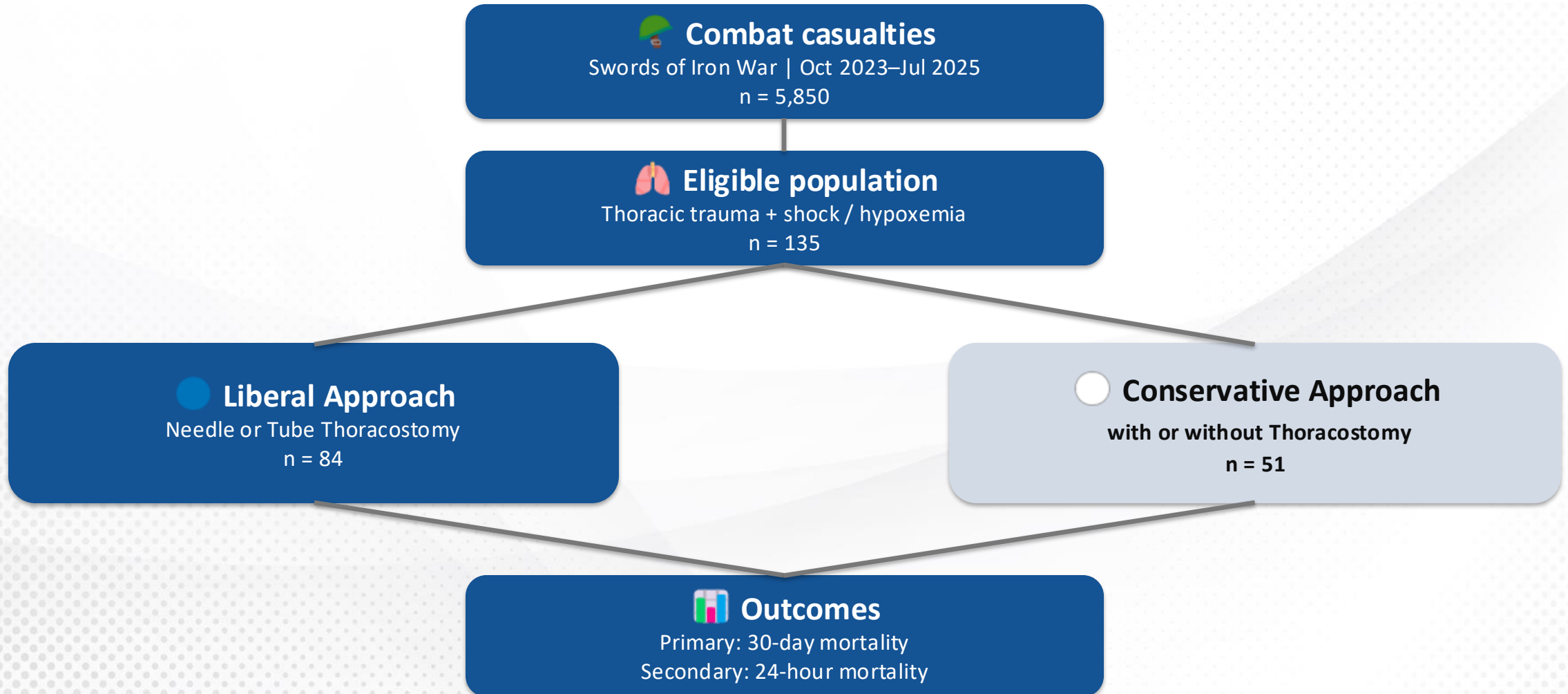
Delayed application



The Power of Implementation



Study Design



Baseline characteristics

	Liberal strategy group (<i>n</i> =84)	Conservative strategy group (<i>n</i> =51)	<i>p</i> -value
Age, median (IQR)	23 (21-30)	22 (21-28)	0.17
Male gender, <i>n</i> (%)	84 (100.0%)	51 (100.0%)	1.0
Injury mechanism, <i>n</i> (%)			
Explosion	41 (48.8%)	29 (56.9%)	0.38
Ballistic injury	40 (47.6%)	18 (35.3%)	0.21
Injury severity score, <i>n</i> (%)			
16-24	33 (39.3%)	13 (25.5%)	0.13
≥25	42 (50.0%)	34 (66.7%)	0.07
Aeromedical evacuation, <i>n</i> (%)*	40/40 (100.0%)	31/32 (96.9%)	0.44
Evacuation time, median (IQR)*	59 (47-72)	58 (45-83)	0.73
Prehospital blood transfusion, <i>n</i> (%)	51 (60.7%)	37 (72.5%)	0.19
Prehospital definitive airway, <i>n</i> (%)	32 (38.1%)	9 (17.6%)	0.01



Results

	 Liberal strategy group (n=84)	 Conservative strategy group (n=51)	 Odds Ratio (95% CI)	 p-value
 24-hours mortality, n (%)	50 (59.5%)	26 (51.0%)	1.41 (0.7–2.85)	0.37
 30-day mortality, n (%)	52 (61.9%)	30 (58.8%)	1.14 (0.56–2.31)	0.72



No significant difference in **24-hour** or **30-day** mortality between liberal and conservative management strategies.



Multivariable Model

	24-hour mortality		30-day mortality	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Ballistic injury vs. explosion	1.93 (0.89-4.27)	0.10	1.57 (0.70-3.59)	0.3
Prehospital blood transfusion	0.80 (0.36-1.77)	0.6	0.61 (0.26-1.40)	0.3
Prehospital definitive AW	5.93 (2.40-16.50)	<0.001	11.4 (3.90-43.1)	<0.001
Injury severity score ≥ 25	1.51 (0.71-3.28)	0.3	2.23 (1.01-5.05)	0.05
Treatment strategy (liberal vs. conservative)	0.98 (0.45-2.18)	0.9	1.32 (0.58-3.03)	0.5

aOR- adjusted odds ratio; 95% CI- 95% confidence interval; AW- airway.

Statistically significant values ($p \leq 0.05$) are given in bold and italics.



Conclusions



PREHOSPITAL CHEST DECOMPRESSION IS UNCOMMON



of combat casualties required prehospital thoracostomy.



DEFERRING DECOMPRESSION WAS SAFE

In a military trauma system with rapid evacuation and early blood product resuscitation, **delaying thoracostomy until arrival at the trauma center** was **not associated with increased 24-hour or 30-day mortality.**



FOCUS ON WHAT SAVES LIVES



Rapid evacuation



Remote Damage Control Resuscitation (RDCR)



Early blood product transfusion

Rather than routine prehospital thoracostomy.



RESERVE THORACOSTOMY FOR SELECTED PATIENTS

Only patients with:



High suspicion of tension pneumothorax



Prolonged evacuation times



TAKE-HOME MESSAGE

In modern military trauma systems, **rapid evacuation and aggressive resuscitation** appear more important than routine prehospital chest decompression.





THANK YOU



At the moment of truth,
IDF MEDICAL CORPS.

