

An illustration of a red blood bag with a white label featuring a red blood drop icon and a barcode. A red tube is connected to the bottom of the bag. The background is a dark blue gradient with faint, light blue technical drawings of circular gauges and scales, some with numbers like 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260.

Prehospital Blood: National Updates

Presented by: Lieutenant Colonel (US Army, Retired) Randi Schaefer, DNP, RN, ACNS-BC, CEN

Schaefer Consulting, LLC

Can we do this?

Extension of hospital Emergency Release Blood Products (ERBP) Programs

- Uncrossmatched blood; Implied Consent

AABB permits Emergency Release Low Titer O Whole Blood

- Standard 5.15.1

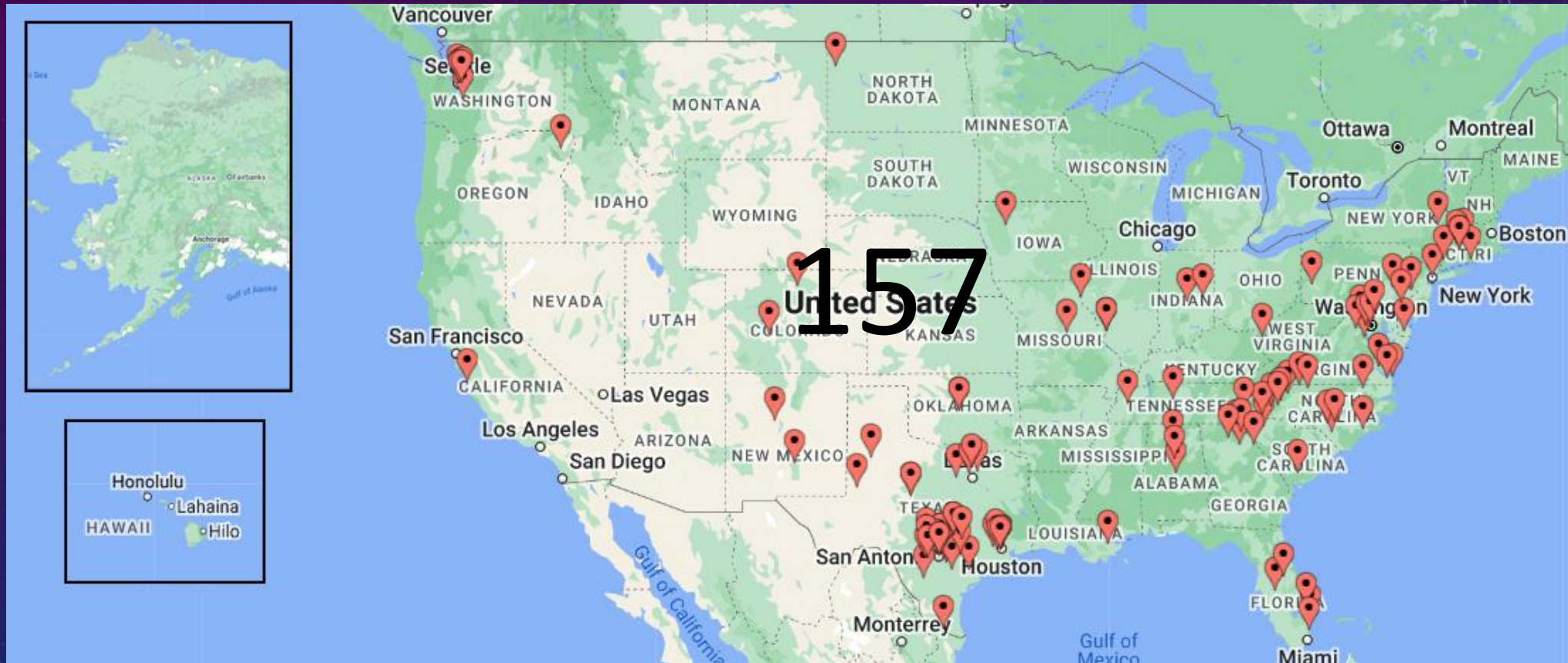
Military has been doing it for over 20 years with success

Civilian implementation

- HEMS in all 50 states
- Ground since 2016



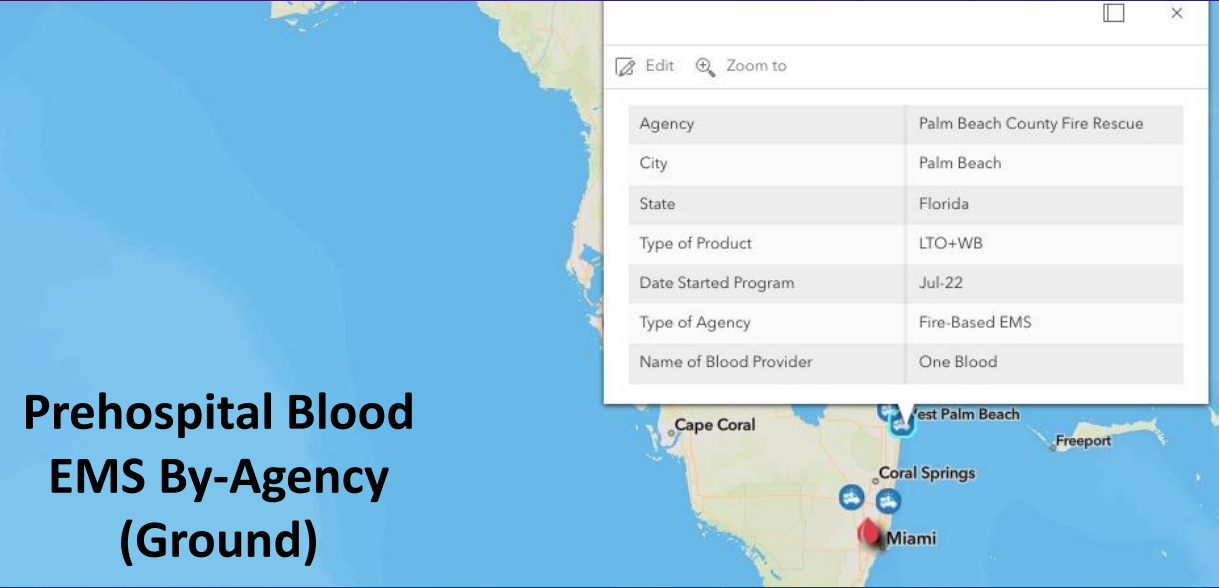
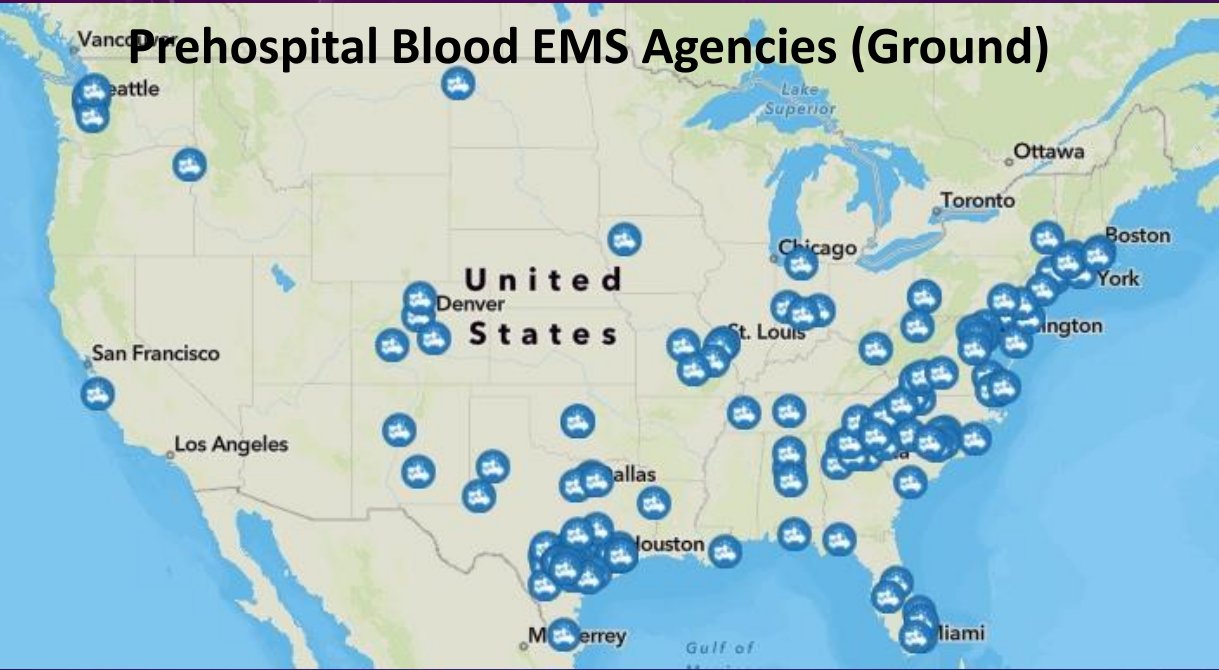
Who Is Doing Prehospital Blood?



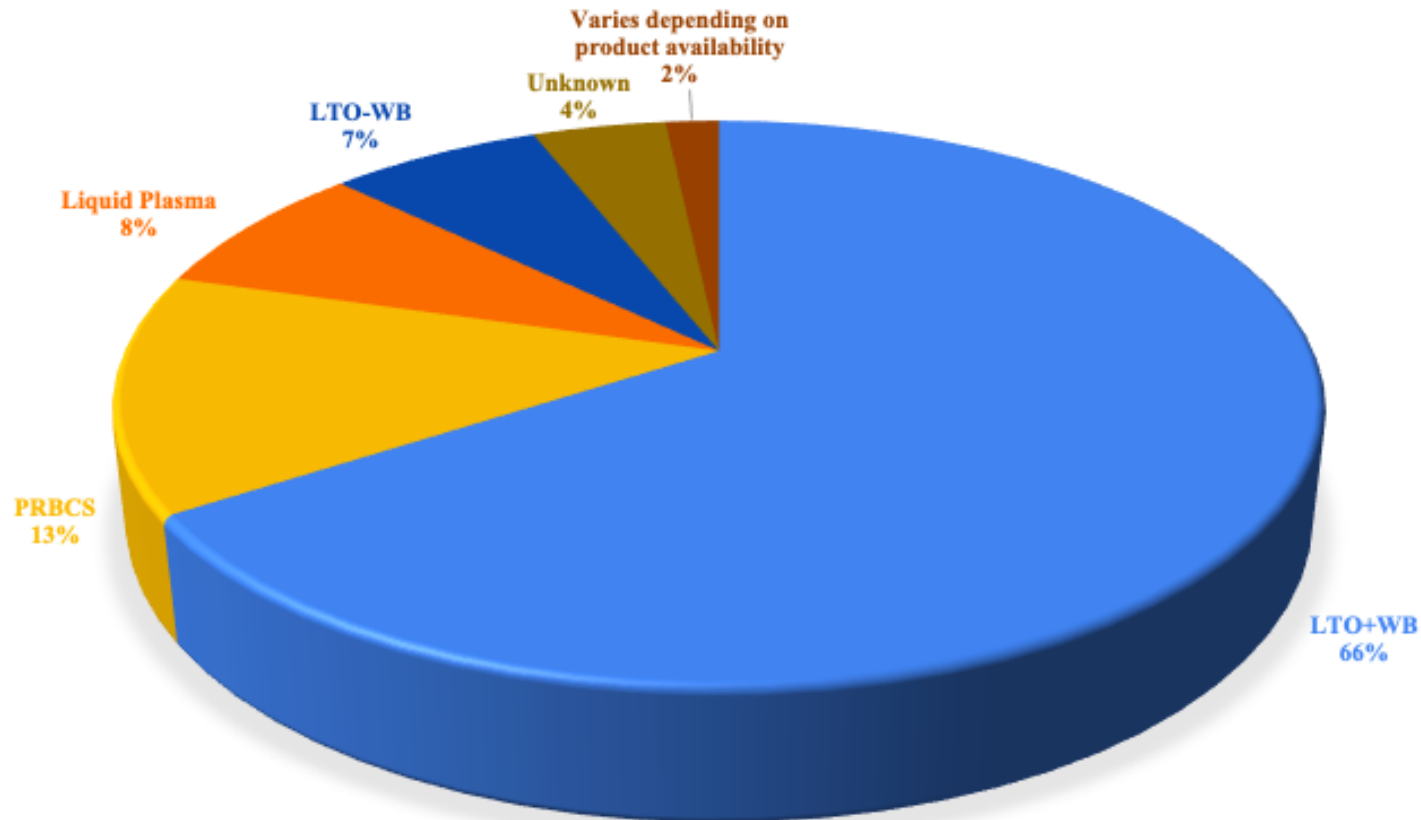
9-1-1 Ground EMS Blood Carrying Agencies as of October 2023

Schaefer, Randall M. DNP¹; Bank, Eric A. AS²; Krohmer, Jon R. MD³; Haskell, Andrew PhD⁴; Taylor, Audra L. MS⁵; Jenkins, Donald H. MD⁶; Holcomb, John B. MD⁷. Removing the barriers to prehospital blood: a roadmap to success. Journal of Trauma and Acute Care Surgery

():10.1097/TA.0000000000004378, May 1, 2024. | DOI: 10.1097/TA.0000000000004378

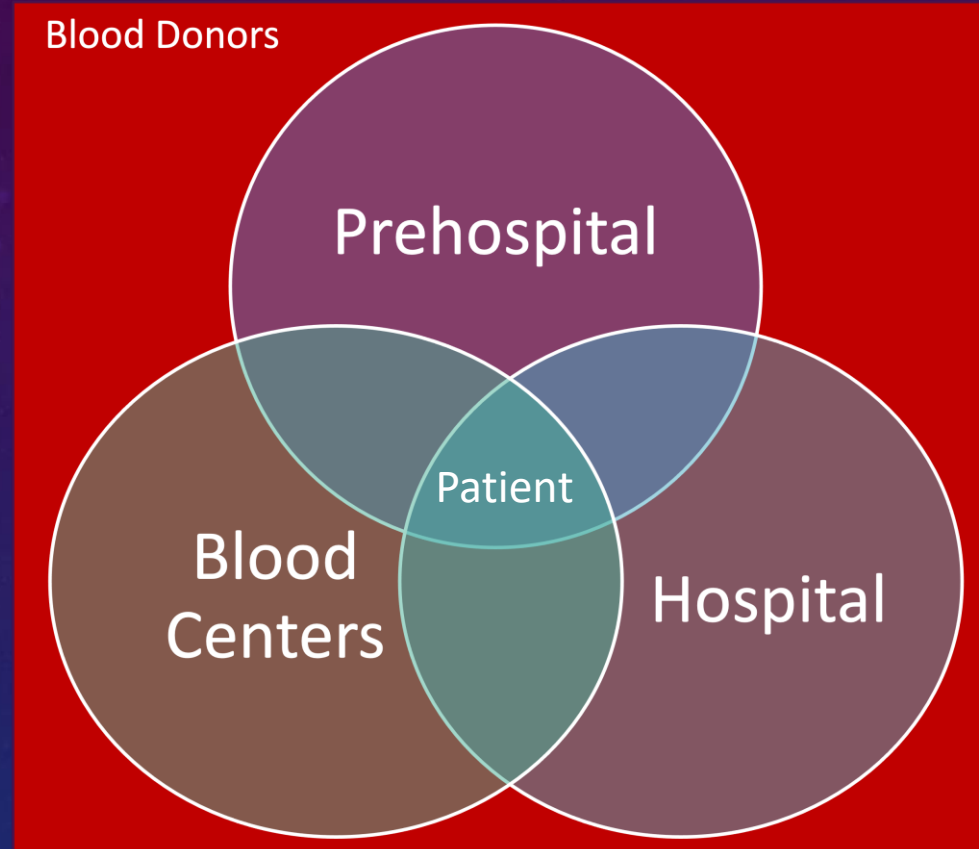


TYPE OF PREHOSPITAL BLOOD PRODUCTS AVAILABLE BY PERCENT



Schaefer, Randall M. DNP¹; Bank, Eric A. AS²; Krohmer, Jon R. MD³; Haskell, Andrew PhD⁴; Taylor, Audra L. MS⁵; Jenkins, Donald H. MD⁶; Holcomb, John B. MD⁷. Removing the barriers to prehospital blood: a roadmap to success. Journal of Trauma and Acute Care Surgery
(DOI:10.1097/TA.0000000000004378, May 1, 2024. | DOI: 10.1097/TA.0000000000004378)

Team Effort



No other prehospital lifesaving intervention requires this level of multi-disciplinary, multi-institutional support.

What If You Are Not A Blood Carrying Agency?

- Mutual Aid and Assist Plan
- Know who is carrying in your region (air and ground)
- Scale up response for MCI and Disaster Response
 - Blood should be tracked as a distinct capability!!!

- Help us gather information and data to build the case!
- Please send any program updates to:
randi.schaefer@schaeferconsulting.net



Blood Regulatory and Study Standards

Randall Schaefer, DNP, RN

Retired Lt. Col, US Army, CEO Schaefer Consulting

Eric Bank, LP, NRP, FAEMS

Assistant Chief Harris Count ESD 48 Fire Department

AABB Out of Hospital Standards Update

- Out of Hospital (Original Standard)- This is not EMS and deals with transfusion activity at health care or home care done out of the standard Hospital environment
- Pre-Hospital- New addition to the standard that strictly addresses the EMS / Pre-Hospital environment of the current and expanding Blood Product use in the field



AHRQ Request for Comments

Key Question for Prehospital EMS Blood Transfusion

PURPOSE:

To support the development of a systematic review (SR) on the feasibility, effectiveness, and safety of blood and blood product transfusions administered in the prehospital setting. The statement of work (SOW) will set the scope for a medium topic refinement and an option for a medium or large SR. The results of the SR will inform future prehospital care evidence-based guidelines (EBG), protocols, and state and local EMS agency decision-making.





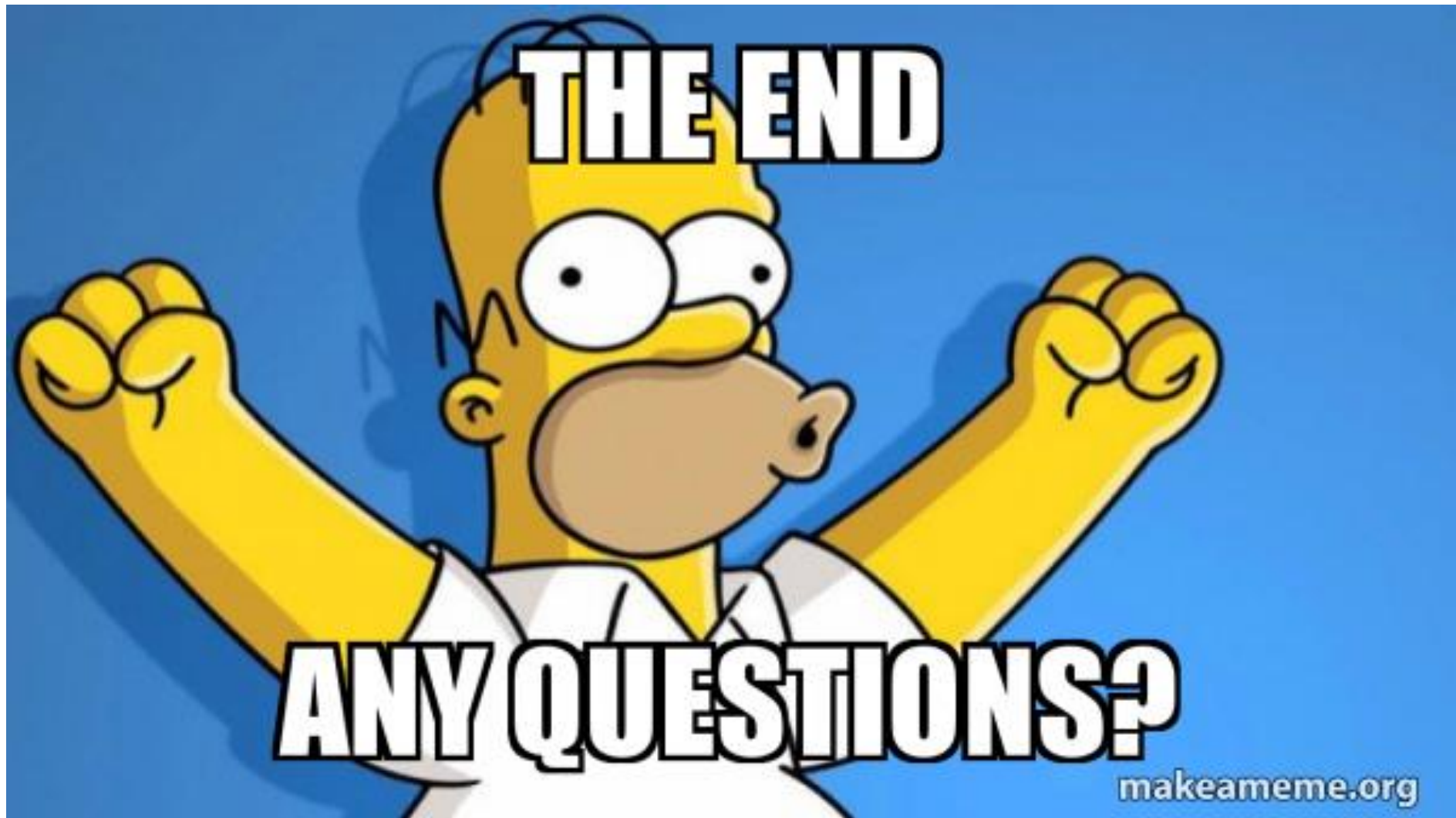
"This could save
more American lives
than any other
initiative in our
lifetime."

John Holcomb, MD, FACS

[Support Us](#)[Play Video](#)

4 Pillar Approach to Achieve Blood Products Nationwide

- Reimbursement for blood products transfused in the prehospital setting
- EMS scope-of-practice modifications to include paramedic initiated transfusions in states where it currently is not allowed
- Strategic preparedness for major mass casualty incidents and other national emergencies
- Outreach and education, including regulatory, protocols, and best practices for programs based on experiences of agencies currently conducting programs.



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Moving The Pendulum of Resuscitation



#SPARC2024

Juan Duchesne MD FACS FCCM FCCP

The William Henderson Chair of Surgery Endowed Professor of Trauma

Division Chief Acute Care Surgery

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TICU Medical Director

Norman E. McSwain Jr. MD Spirit of Charity

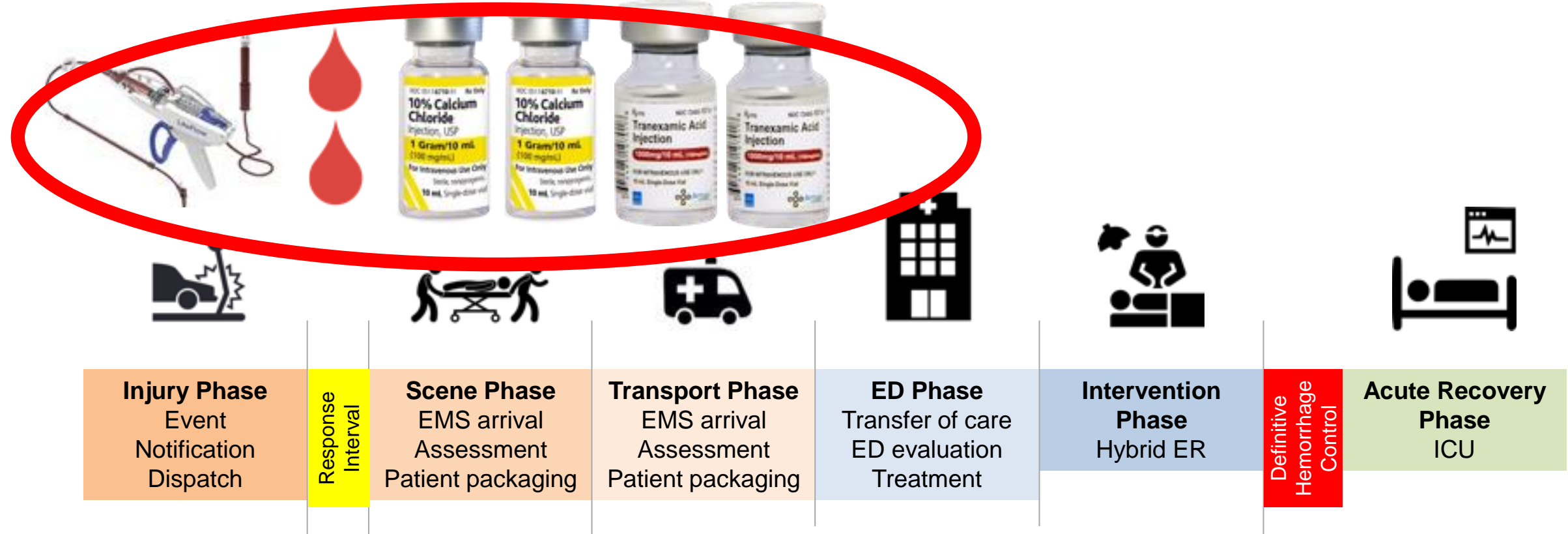
Level I Trauma Center University Medical Center New Orleans

**Is it time to adopt
Advanced
Resuscitative
Care
(ARC)
in the
Civilian Setting?**

Background

In 10/2021 NOEMS started prehospital
Advanced Resuscitative Care (ARC)
bundle for our urban ground EMS system
with prioritization of a circulation
approach in trauma patients with
hemorrhagic shock





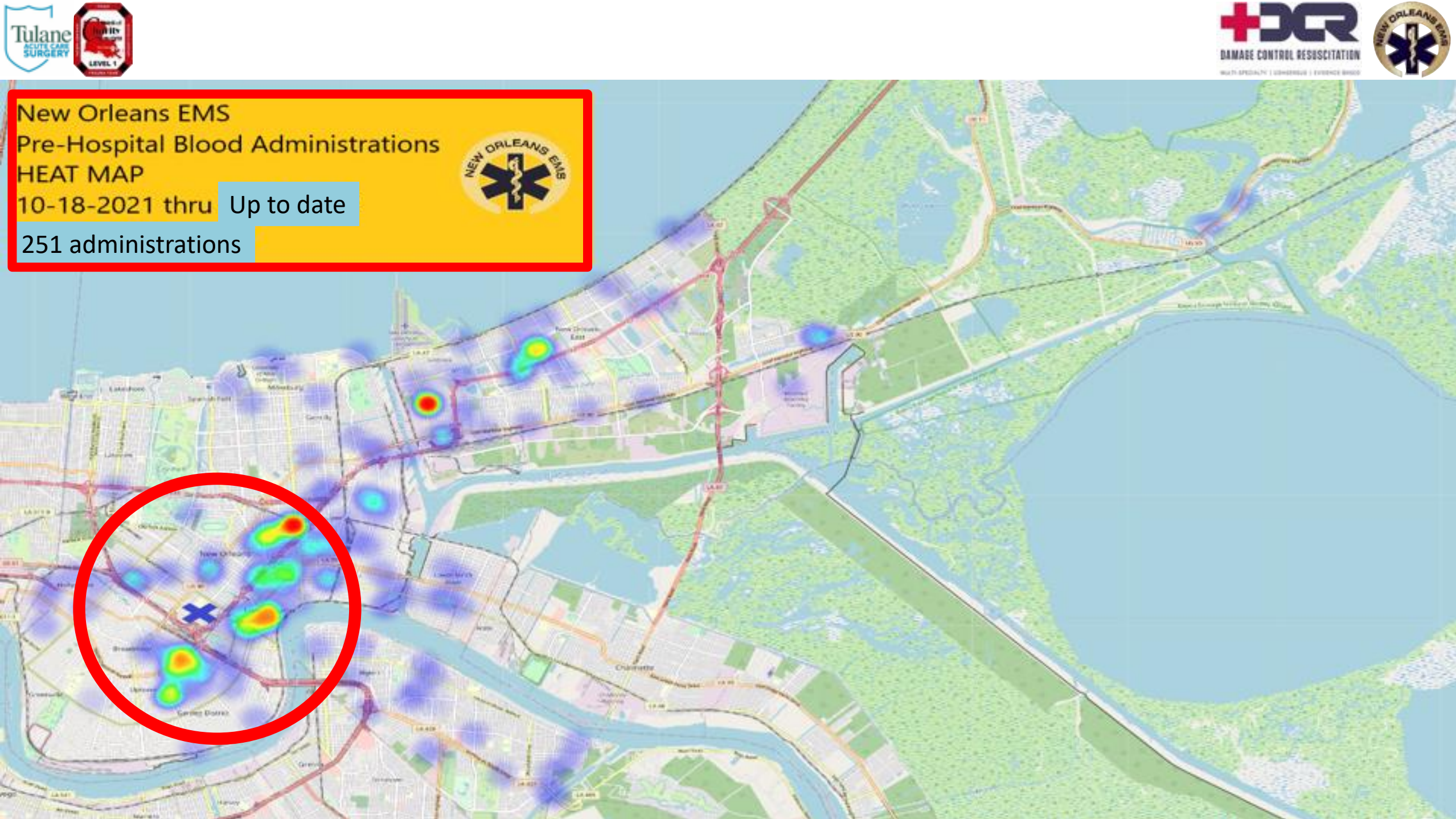
Pre-hospital ARC *Bundle*

Bundle triggers:

$SBP \leq 70$ mmHg

or

$SBP \leq 90$ mmHg & $HR > 110$ at EMS arrival on-scene



FASTER REFILL IN AN URBAN EMS SYSTEM SAVES LIVES: A PROSPECTIVE PRELIMINARY EVALUATION OF A PREHOSPITAL ADVANCED RESUSCITATIVE CARE BUNDLE

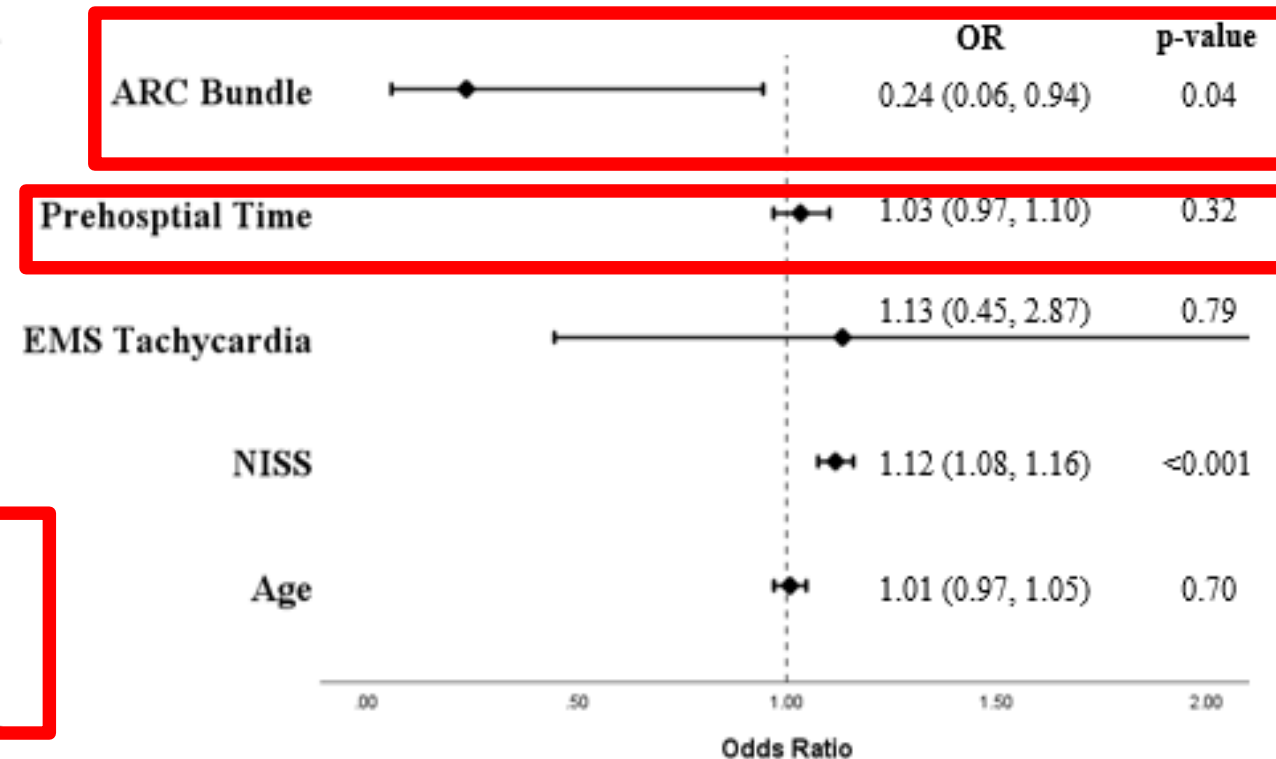
Broome JM, Nordham K, Tatum D, Piehl M, De Maio V, Nichols E, Dransfield T, Rayburn D, Marino M, Smith A, Taghavi S, Harris C, Lacy E, Avegno J, Duchesne J

A.

Variable	HC (n=144)	ARC Bundle (n=51)	P-value
EMS Characteristics			
SBP, mmHg	80 (62-88)	71 (60-83)	0.22
HR, bpm	101 (72-126)	103 (72-136)	0.35
Shock Index	1.20 (0.87-1.60)	1.22 (0.77-1.77)	0.92
Endotracheal Intubation	11 (8%)	0 (0%)	0.04
911 call to hospital arrival	20 (15-24)	24 (20-31)	<0.01
Hospital Characteristics			
ED SBP, mmHg	107 (80-124)	114 (88-140)	0.42
ED HR, bpm	97 (75-121)	79 (62-101)	0.01
ED Shock Index	0.88 (0.70-1.26)	0.79 (0.50-1.03)	0.01
New ISS	17 (4-27)	18 (12-34)	0.07
24 Hour Mortality	27 (19%)	3 (6%)	0.03
In-hospital Mortality	33 (23%)	5 (10%)	0.04

Historic Controls (HC), Advanced Resuscitative Care (ARC) Systolic Blood Pressure (SBP), Heart Rate (HR), New Injury Severity Score (NISS), Emergency Department (ED)

B.



Section II: Evaluation, Management, Resuscitation

Treat the Greatest Threat to Life First: x A B C D E F

x - eXsanguinating eXternal Hemorrhage Control - Stop The Bleed, etc.

A - Airway Assess / Manage - Protect cervical spine, consider hemodynamics

B - Breathing and Ventilation

C - Circulation and Resuscitation

D - Disability / Neurologic Assess / Manage

E - Environmental Factors - Heat, Cold, Chemical Injury

F - Further Factors - Pediatric, Geriatric, Pregnant patients, Intimate Partner



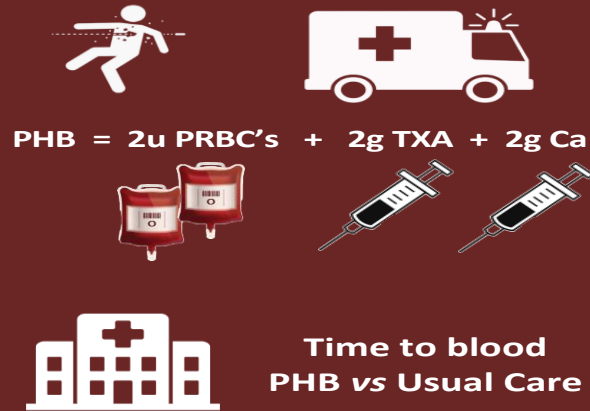
Impact of prehospital “xABC” Resuscitation Sequence in Patients with Severe Hemorrhage

Conclusion: In prehospital hypotensive patients with penetrating injuries, advanced resuscitative care focused on utilizing blood products first prior to intubation improves patient mortality. Standardization of prehospital circulation-first management in this patient population warrants special consideration.

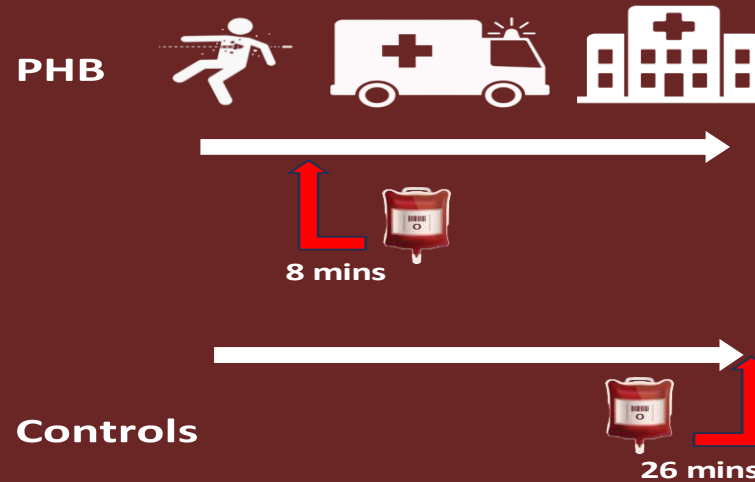
Variable	ARC (n=62)	ABC (n=31)	P-value
Age	35 (24-43)	31 (25-40)	0.90
EMS Characteristics			
SBP, mmHg	78 (66-88)	70 (0-80)	0.79
HR, bpm	114 (84-136)	116 (55-140)	0.05
Shock Index	1.48 (0.94-1.77)	1.57 (1.36-2.05)	0.09
GCS	8 (3-15)	5 (3-15)	0.43
Total Prehospital Interval	22 (16-26)	20 (15-25)	0.176
Hospital Characteristics			
ED SBP, mmHg	110 (84-136)	66 (0-93)	0.02
ED HR, bpm	92 (69-121)	95 (0-129)	0.12
ED Shock Index	0.85 (0.60-1.27)	1.31 (1.09-1.63)	<0.01
ED GCS	15 (14-15)	3 (3-12)	<0.01
In-hospital Mortality	10 (13%)	9 (47%)	<0.001

Every Minute Matters: Extending the Continuum of Care Through Early Prehospital Blood Administration

Study Population



Results



Conclusions

Odds In-Hospital
Mortality



Odds Ratio
(95% CI)

OR for Each
Minute of Delay 1.11
(1.04-1.19)

Every 1 Minute Delay = 11%
increased mortality

+ + = Lives Saved

Duchesne J, McLafferty BJ, Broome JM, et al. Every minute matters: Improving outcomes for penetrating trauma through prehospital advanced resuscitative care. *J Trauma Acute Care Surg.* May 1, 2024.

Author twitter handles:
[@Tulane_Surgery;](#)
[@JakeBroome;](#) [@MarkPiehl](#)



**Western Trauma
Association**

Conclusion: Compared to patients who first received blood after hospital arrival, resuscitation with blood products was started 19 minutes earlier after initiation of a PHB program despite a 5-minute increase in prehospital time. A survival for early PHB use was demonstrated, with an 11% mortality increase for each minute delay to blood administration. Early interventions such as PHB may help minimize "dead zones" in trauma care by bringing effective resuscitation closer to the point of injury.

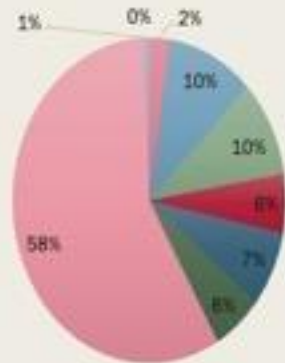
Western Trauma Association 2024: Scalea Award Competition

SPARC REGISTRY

jduchesn@tulane.edu

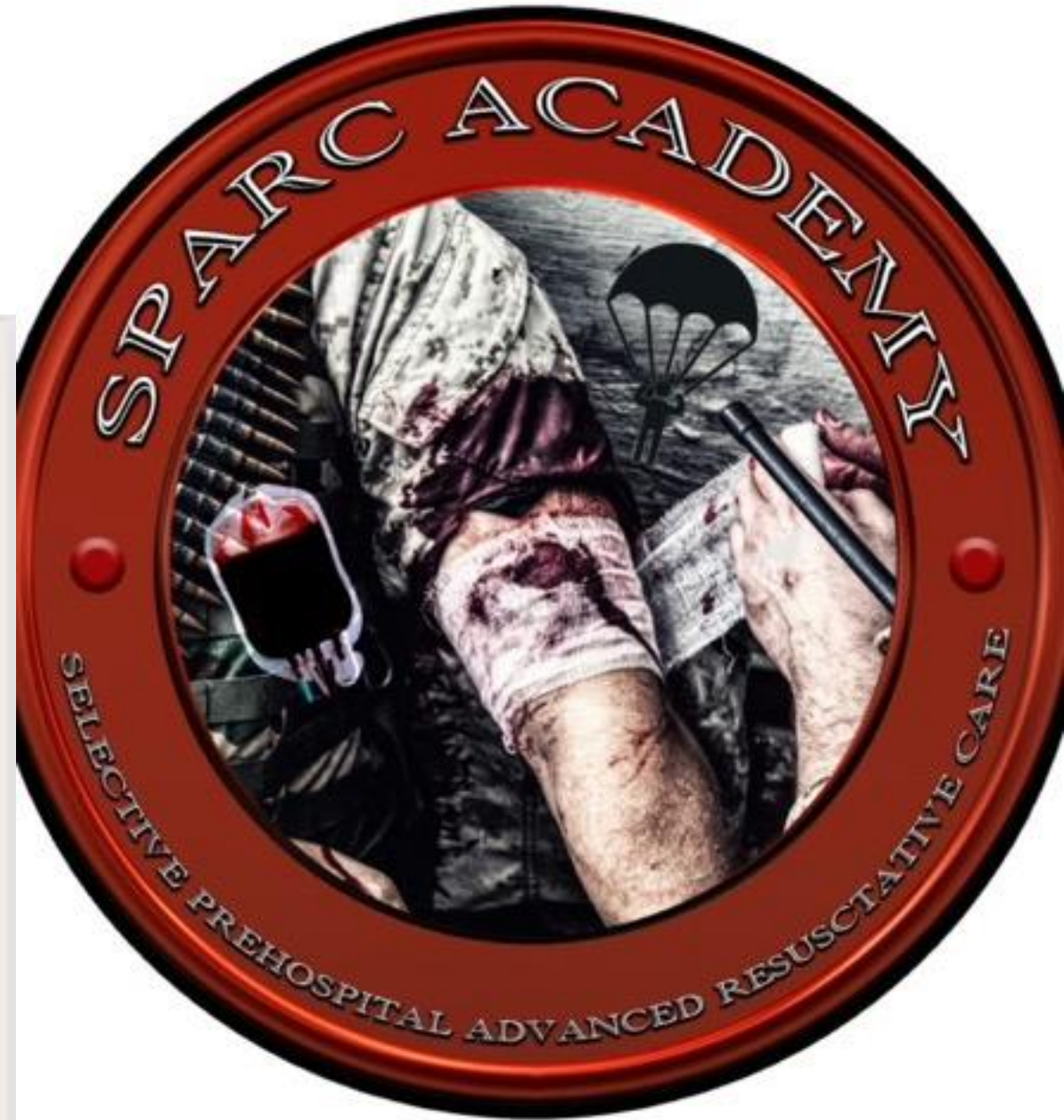
REDCap Entries

- Tenet- Delray Medical Center
- UCHealth Medical Center of the Rockies
- Northeast Georgia Health System
- CommonSpirit -Penrose Hospital
- CommonSpirit-St. Anthony Hospital
- Tenet- St. Mary's Medical Center
- Tulane University
- Our Lady of the Lake
- Yale



Total entries 5/30/24: 497

Site	Number of Completed Records
Tenet- Delray Medical Center	10
UCHealth Medical Center of the Rockies	81
Northeast Georgia Health System	47
CommonSpirit -Penrose Hospital	25
CommonSpirit-St. Anthony Hospital	39
Tenet- St. Mary's Medical Center	46
Tulane University	245
Our Lady of the Lake	4
Yale	0



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