



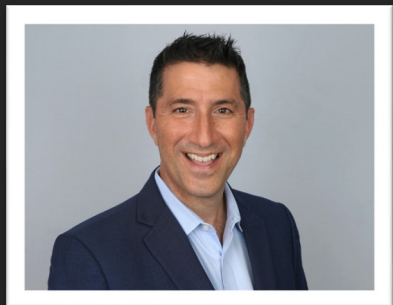
Designee Discussion

Whole Blood in EMS

*"For the life of the flesh is in the blood.."
Leviticus 17:11*



Center for
Public Safety
Excellence



Peter Antevy, MD

EMS Medical Director, PEM Physician
Peter@Handtevy.com



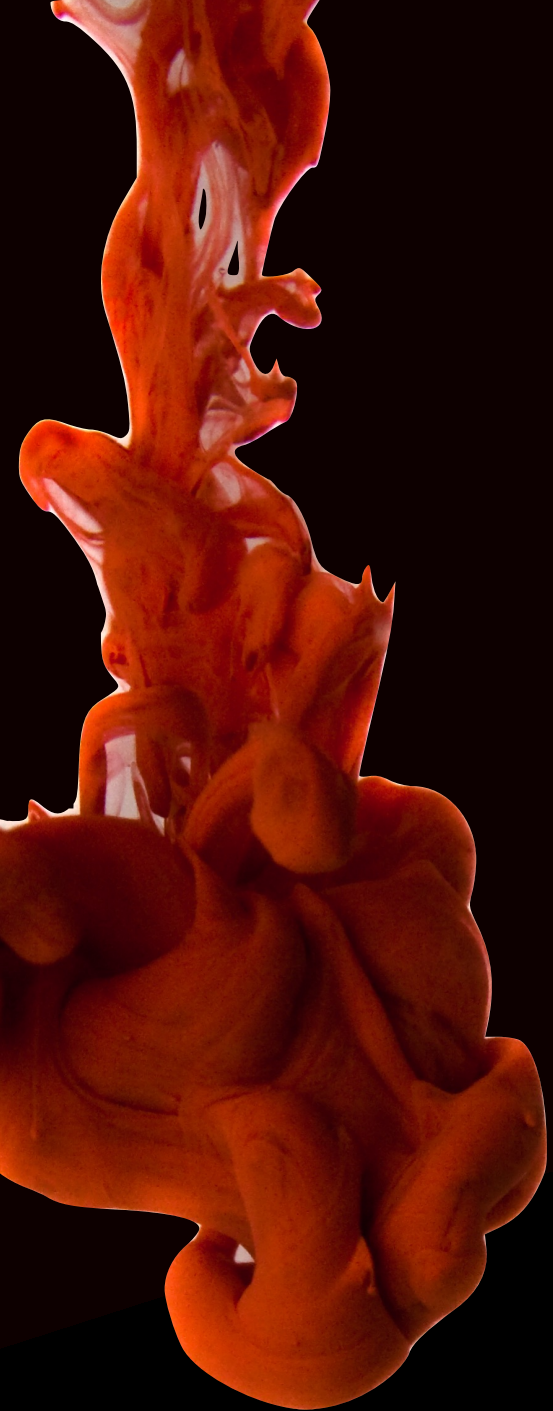
Disclosure

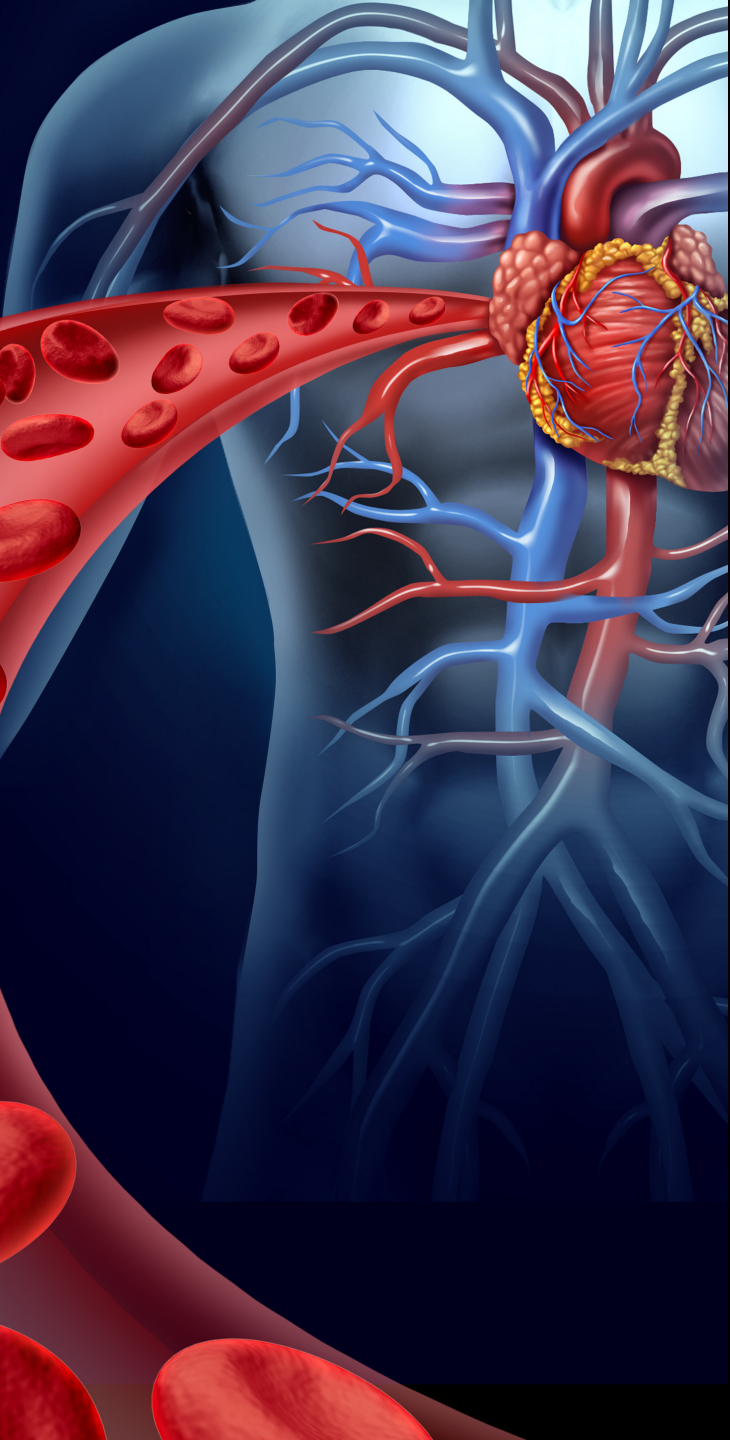


Founder & Chief Medical Officer

Slides by Mark Piehl, MD, MPH

Minutes Matter





Minutes Matter



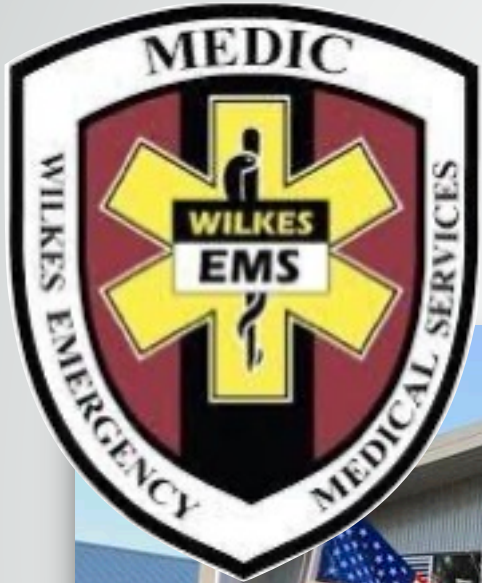
08:08





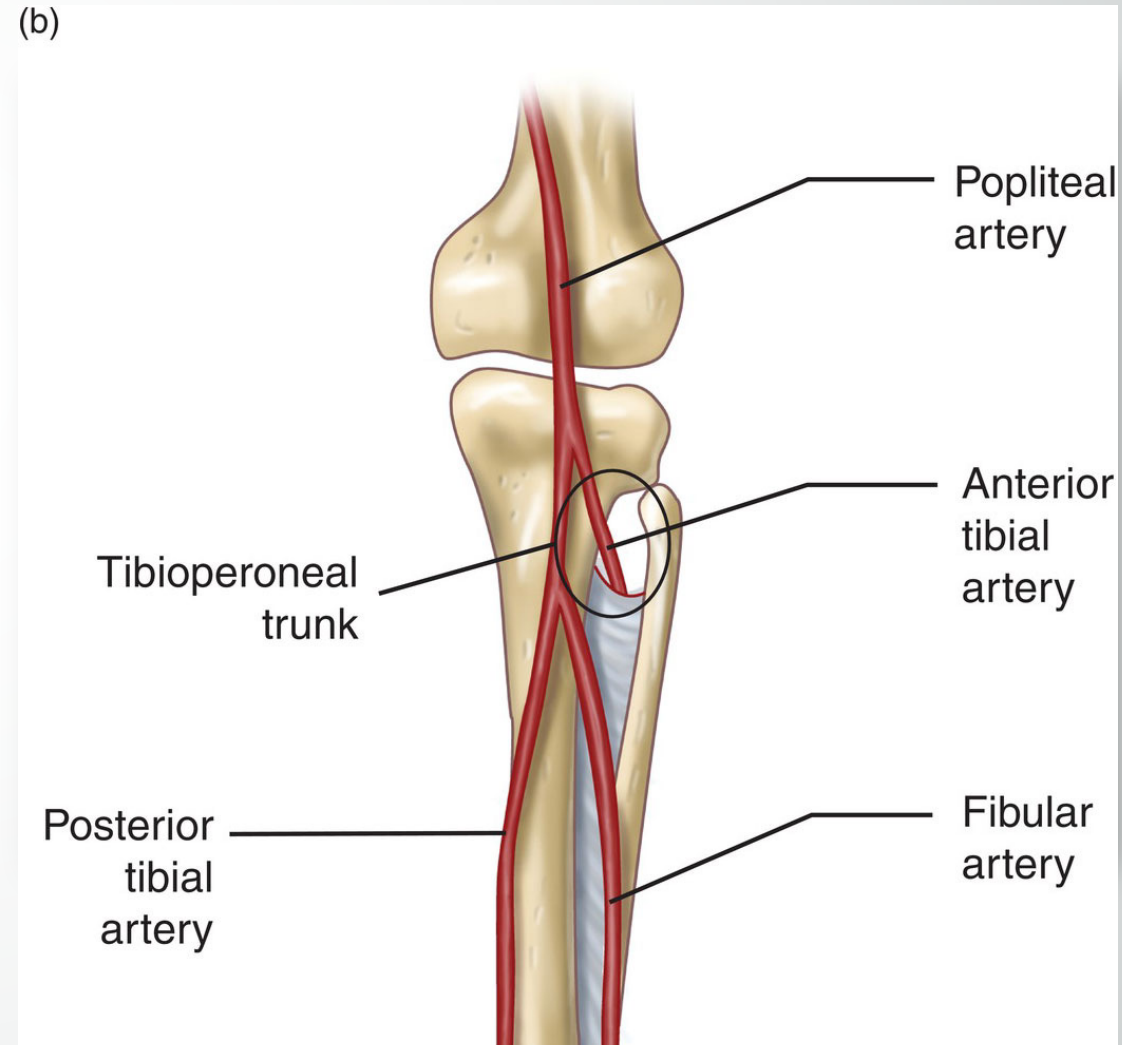


A Tale of Two Agencies



Case #1

- 20's healthy male
- Accidental firearm discharge
- Drove himself to hospital
- Lost consciousness
- Wrecked



Case #1

- Unresponsive, pulseless
- Tourniquet, CPR initiated
- Intubated, Epi x 2
- Blood arrived
- 2U warmed LTOWB 5 min
- ROSC



Case #1

- Flown to Baptist
- 3 weeks ICU, tracheostomy
- Fasciotomy L leg
- Woke up
- Discharged neurologically normal





Case #2

- 30's female
- Multiple GSW Torso
- Unresponsive
- SBP 60



Case #2

- 1u warmed LTOWB
- 2.5 min transport
- Woke up
- “What’s that warm feeling in my arm”
- Survived



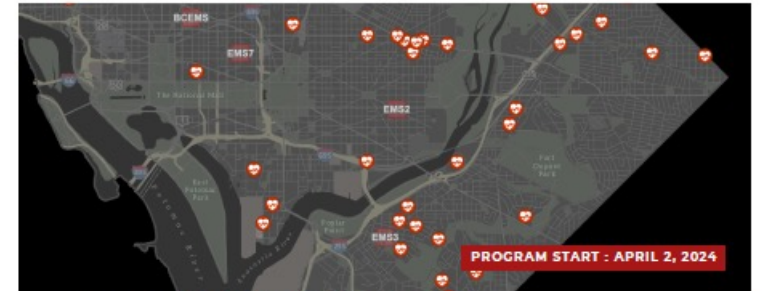




LTOWB Newsletter

ADMINISTERED: 58 UNITS

June 2024



The results of saving lives, the nature of our profession, sometimes cannot be measured. In the case of blood, providers aren't saving just minutes or hours but decades of life-years.

The first Low Titer O Blood unit was delivered on April 10, 2024. Since then, patients throughout the District have received this new innovative life-saving treatment. Patients who have presented with critical and devastating injuries or illnesses have survived and returned to their homes and families. This program would not be successful without our partnerships and their continued unwavering support.

➤➤ BABAK SARANI, MD, FCAS, FCCM
Professor of Surgery and Emergency Medicine
 Director, Center for Trauma and Critical Care
 George Washington University

The whole blood program is literally life saving. The bundle of whole blood, calcium chloride, and TXA is so effective that we are having a hard time enrolling patients into an international randomized study evaluating hemorrhage because patients who are GCS 15 are excluded. Again and again, I see that patients who were hypotensive and had a GCS less than 15 when DCFD EMS arrived on scene arrive to GW with a GCS 15 and perfusing blood pressure because they received this life-saving bundle. There is no doubt whatsoever in my mind that DCFD is at the forefront of prehospital care, in large part to this initiative.

➤➤ CHRISTINE TRANKIEM, MD, FCAS
Chief, Trauma & Acute Care Surgery
 MedStar Washington Hospital Center

DCFEMS Field Low Titer Whole Blood program is a game changer for the District. The partnership between DCFEMS and the trauma centers of Washington DC is making a difference and saving lives. Proud to partner with DCFEMS, at the tip of the spear of innovative and comprehensive prehospital care.

In this newsletter
you can expect:

Previous Case
Updates

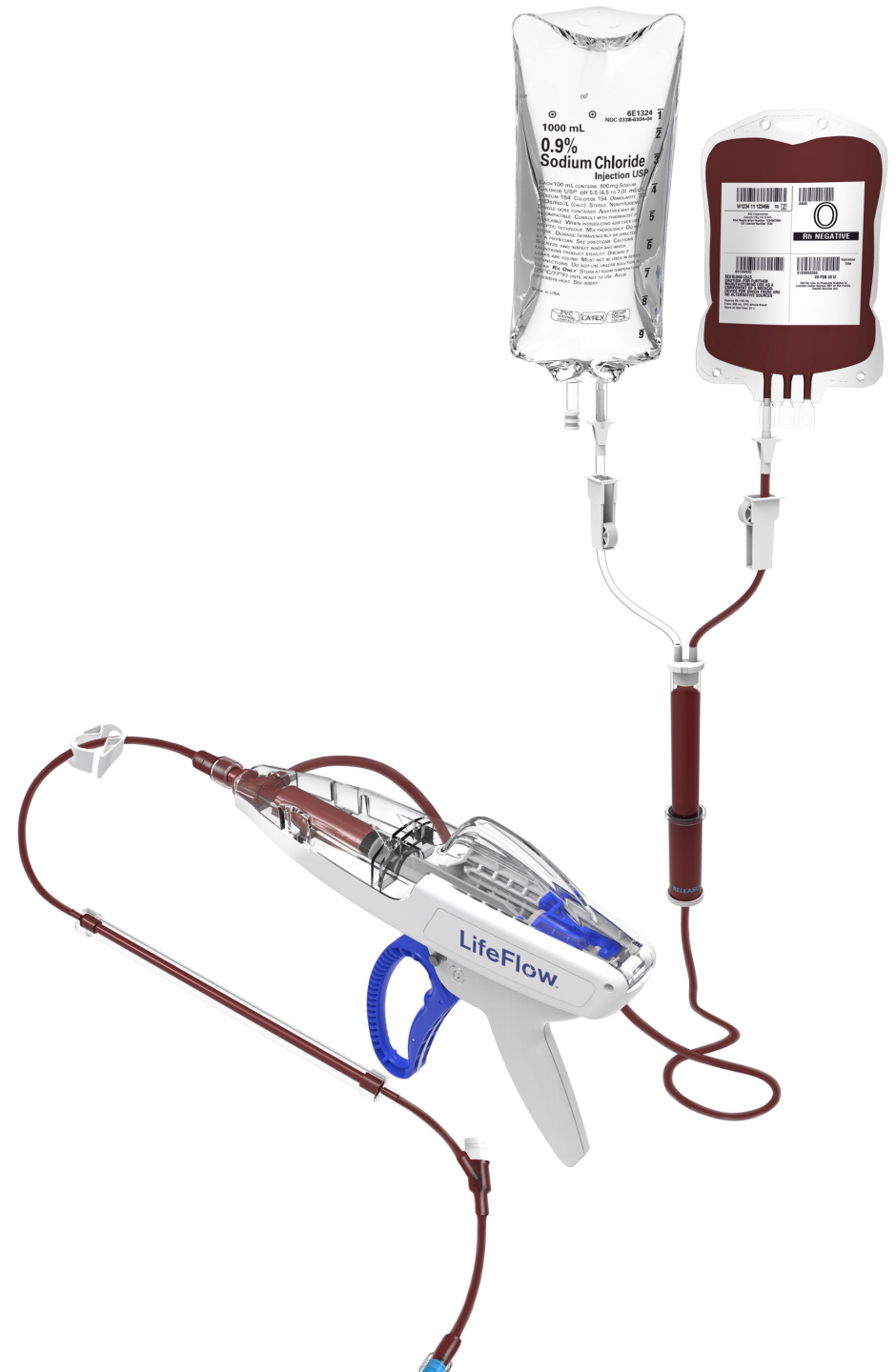
Case Review

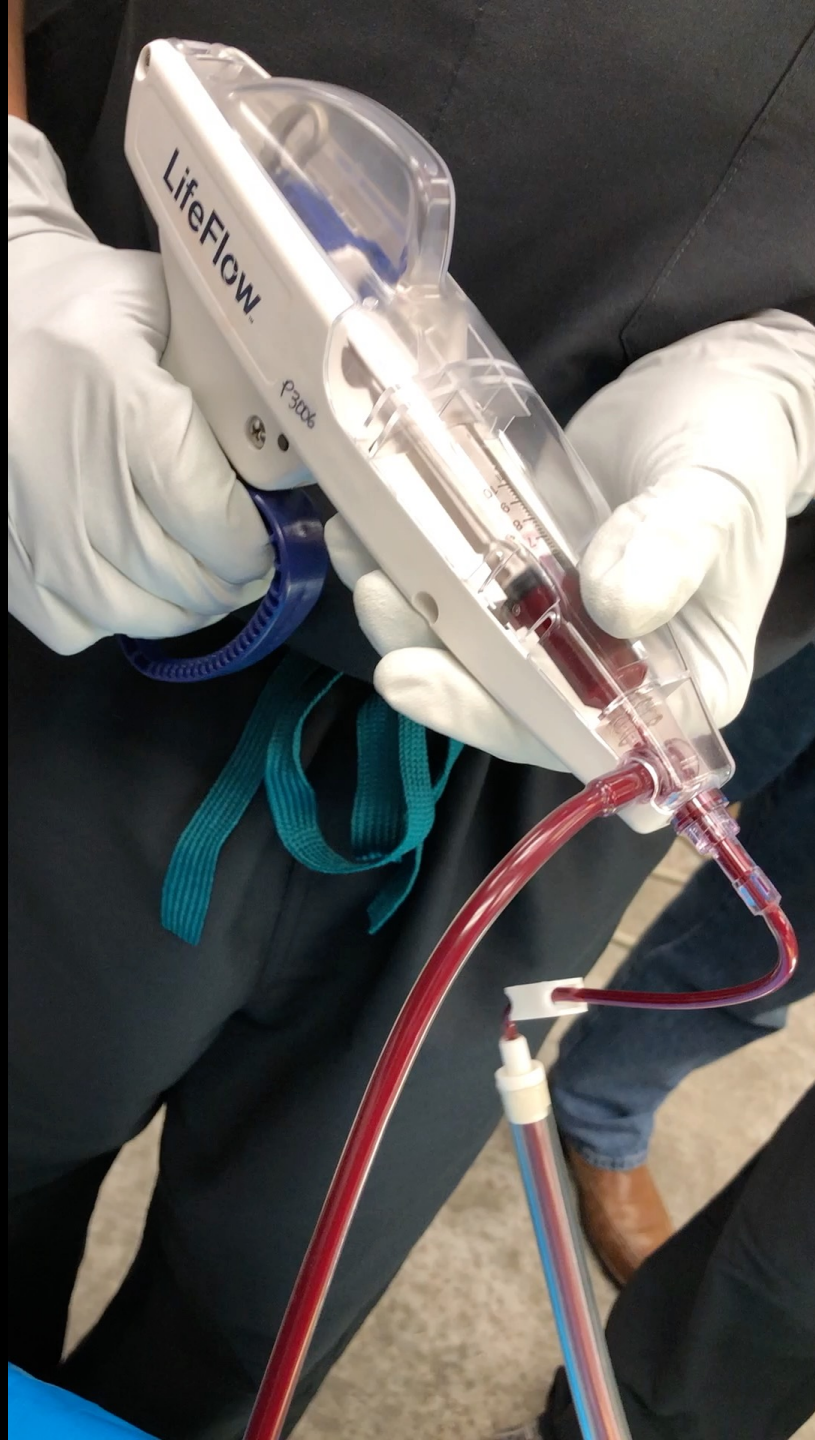
Dispatch and
Demographic
Data

Data Collection
Update

Provider
Commentary

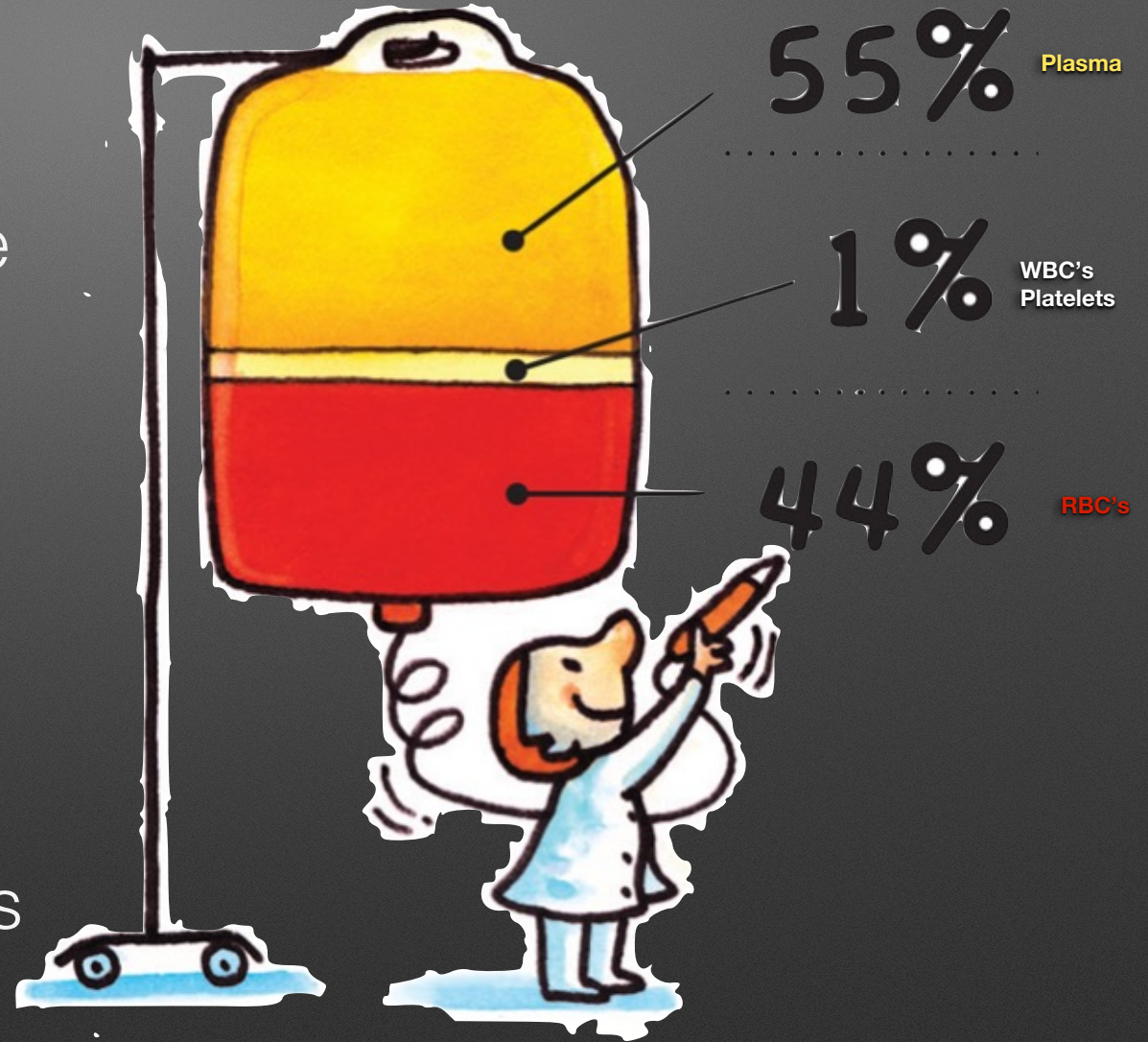
Physician
Commentary





Whole Blood vs. Component

- O-negative best
- O-positive most widely available
- Low-titer whole blood (LTOWB): low anti-A and anti-B antibodies
- Leuko-reduced minimizes transfusion reactions
- Whole blood storage 14-35 days vs 43 for PRBC's



A Tale of Two Teenagers



Case # 3

- 14yo dirt bike accident
- GCS 3, apneic
- HR 141, BP 140/80
- BVM en route
- SBP 70's after intubation in ED



Case # 3

- 500ml 0⁺ WB x 2
- To OR, 4 additional units blood
- Extubated next day
- Discharged day 5 neurologically normal





Case # 4

- Teenager GSW to chest, abdomen, upper extremity
- GCS 8
- HR 110, BP 80/30 (**SI 1.4**)



Case # 4

- Prepped for intubation



2023- 00:51:19 -0500
AXON BODY 3 X60AA8542



1254003



2023- [redacted] 00:52:11 -0500
AXON BODY 3 X60AA8542



2023- 00:59:25 -0500
AXON BODY 3 X60AA8542



Case # 3

- 1U blood - more awake
- 2nd unit - GCS 15
- HR 90, BP 110/90 (**SI 0.8**)
- Intubation deferred
- To ED awake & stable



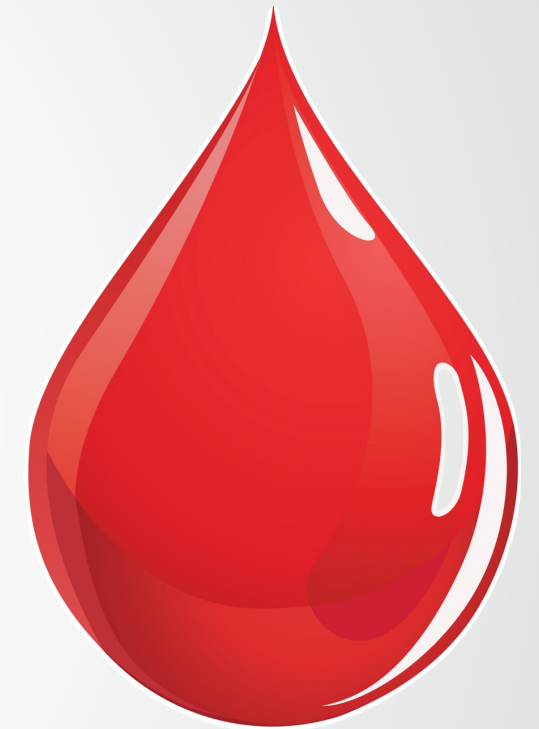
Why do we think airway first?



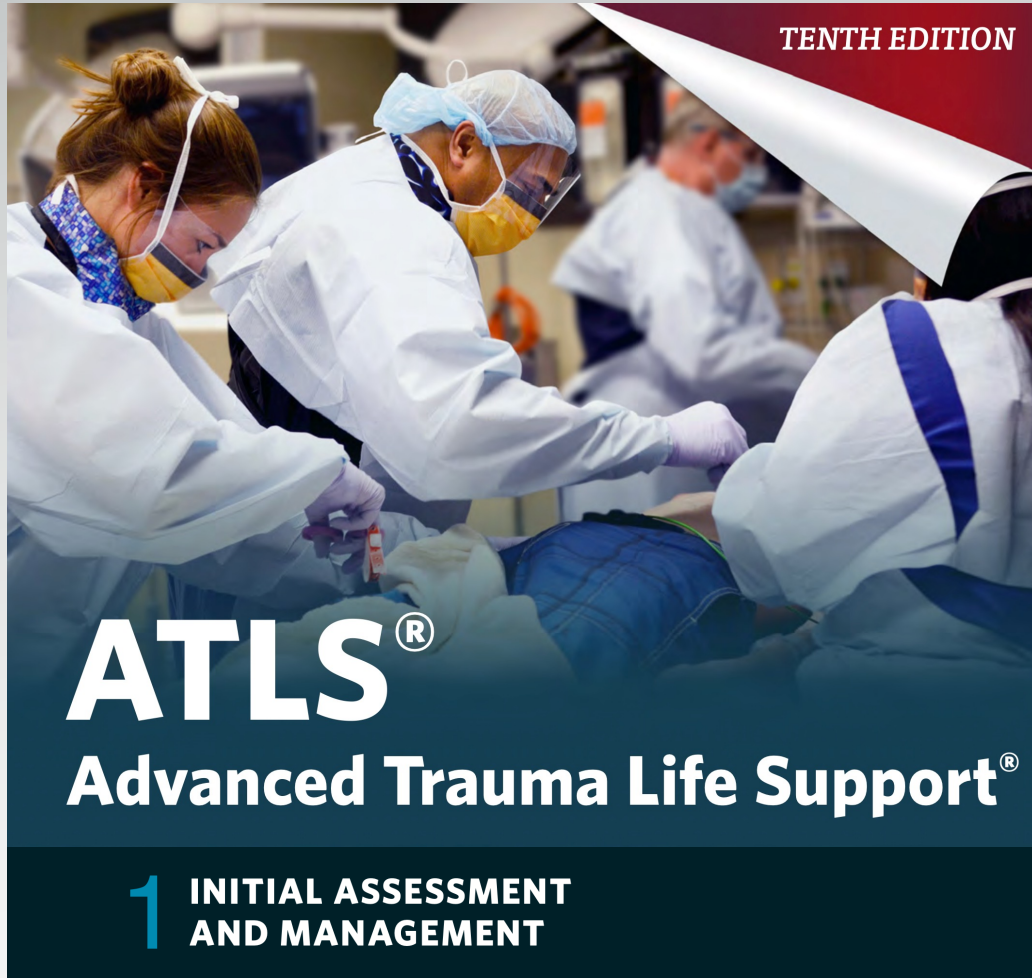
A



B



C

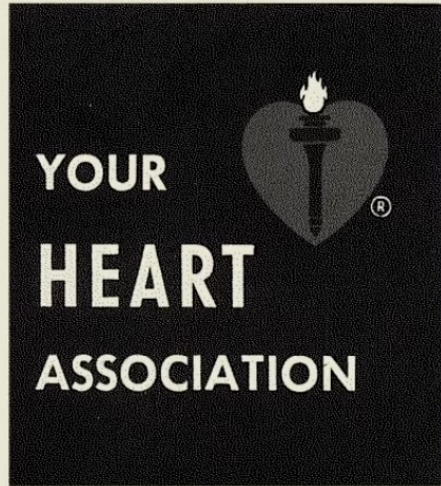


- Regardless of the injury causing airway compromise, the **first priority is airway management**: clearing the airway, suctioning, administering oxygen, and opening and securing the airway
- Patients with severe head injuries who have an altered level of consciousness or a **GCS < 8** usually require the **placement of a definitive airway**
- **Establish a definitive airway** if there is any doubt about the patient's ability to maintain airway integrity

A - B - C

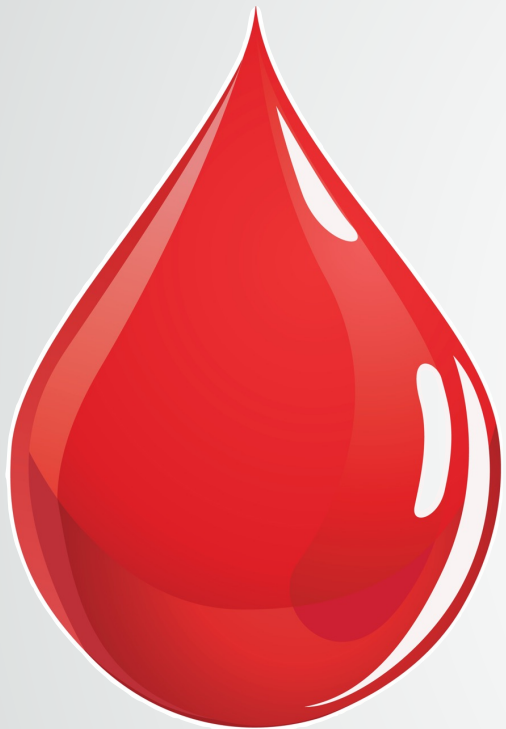


C - A - B



1963: CPR endorsed by the American Heart Association

Circulation first



C

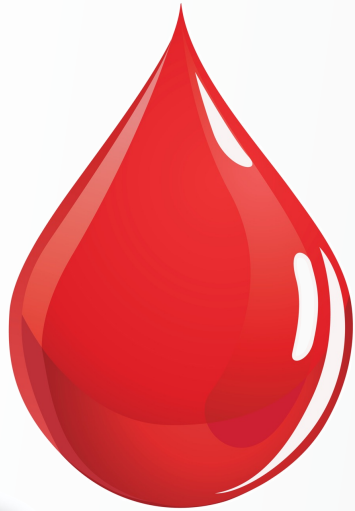
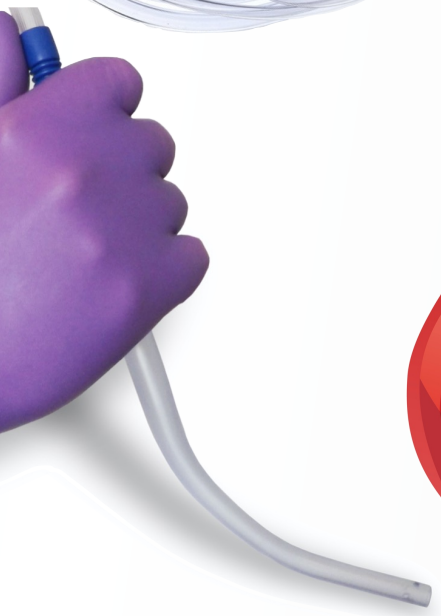


A



B

Circulation first



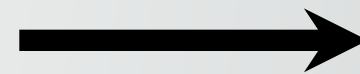
C



A

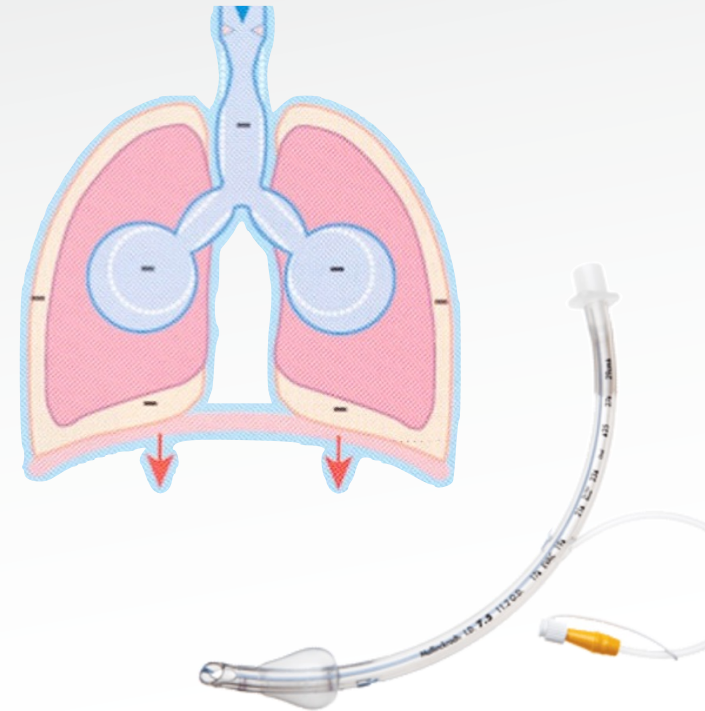


B



Why Resuscitate Before You Intubate?

- **P**remeds
- Respiratory **P**ump
- Intra-thoracic **P**ressure



Premeds

Induction agents can cause:

- reduced sympathetic tone
- vasodilation
- myocardial depression



Premeds

Induction agents can cause:

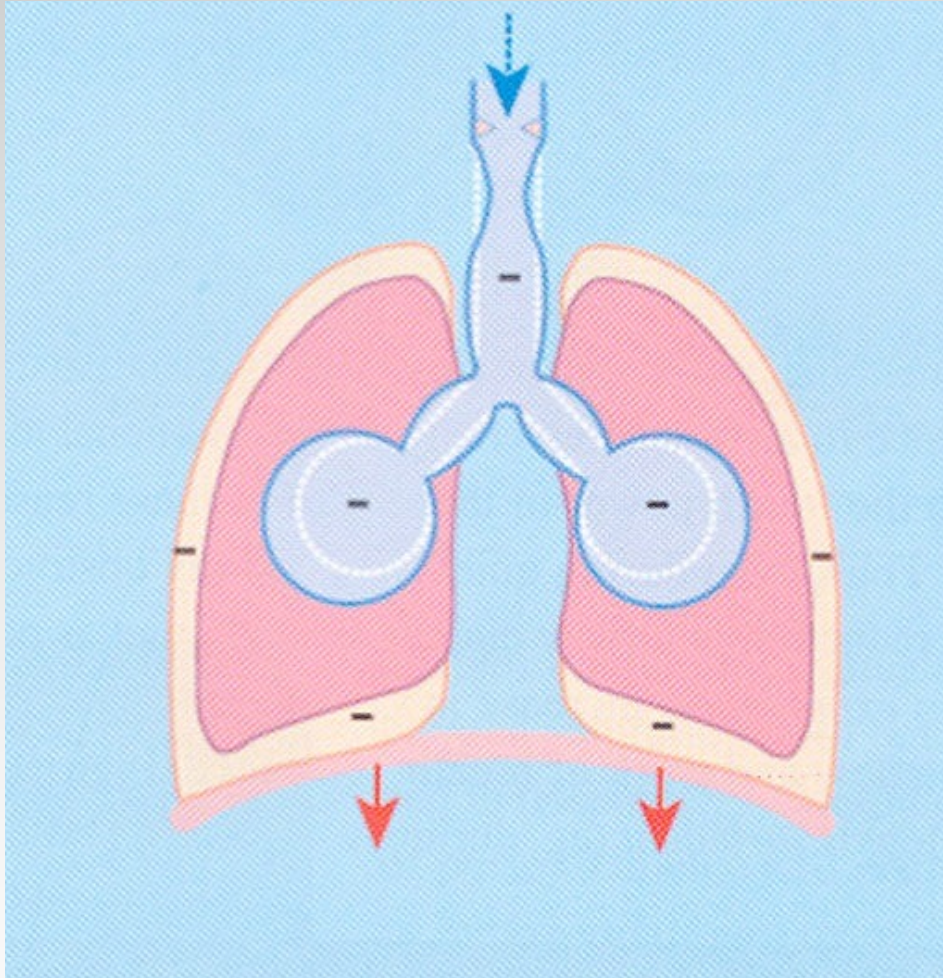
- reduced sympathetic tone
- vasodilation
- myocardial depression

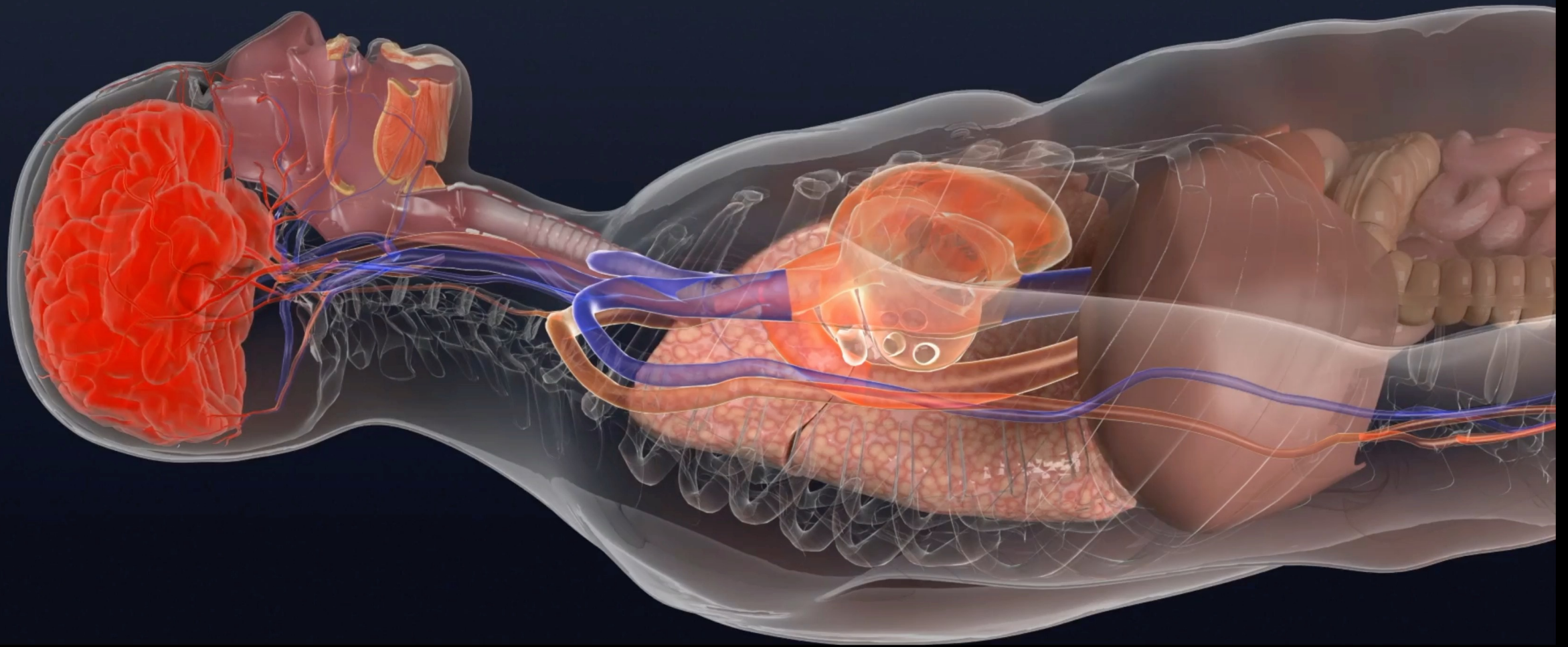


Paralytics



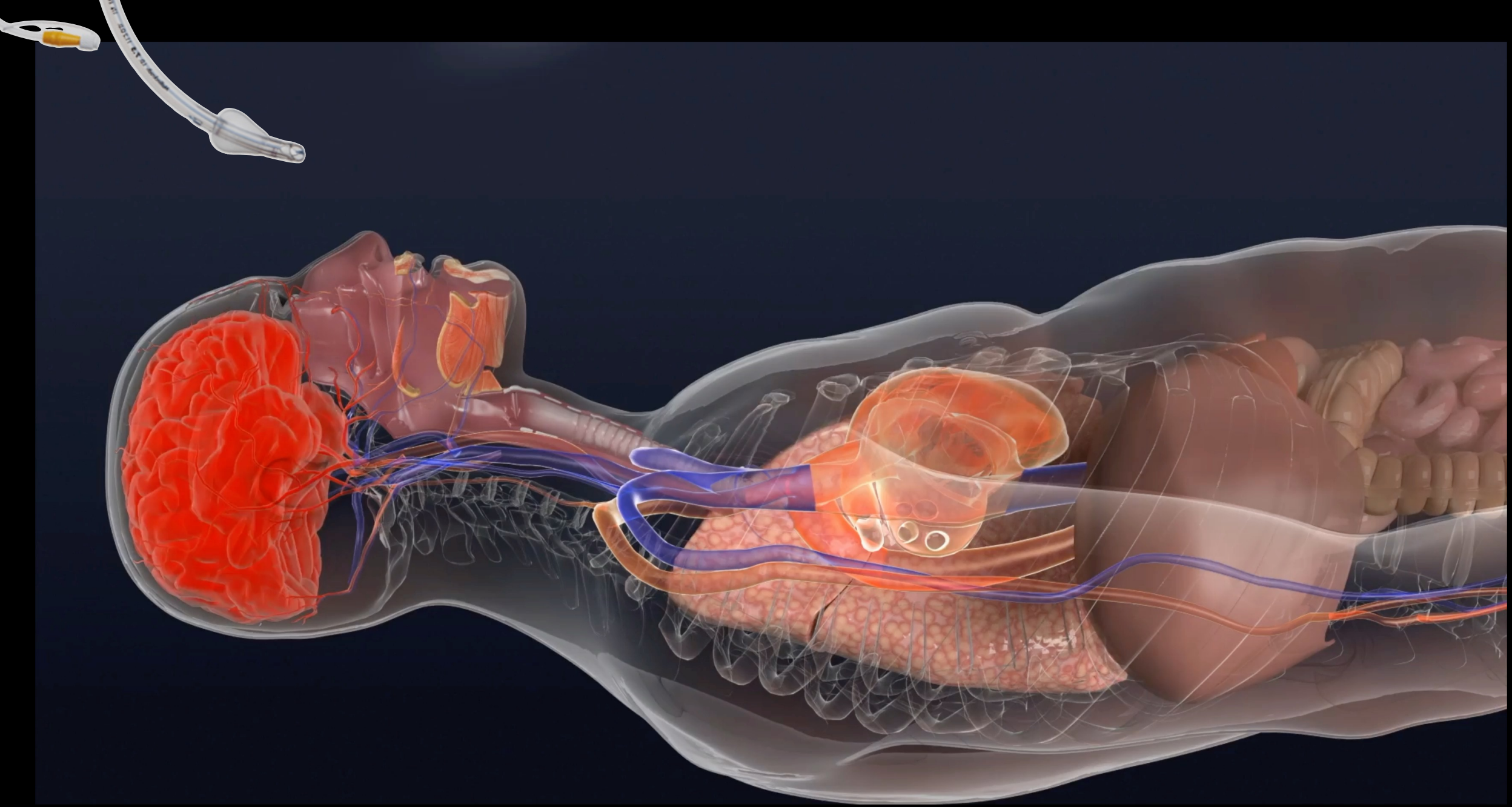
Respiratory Pump



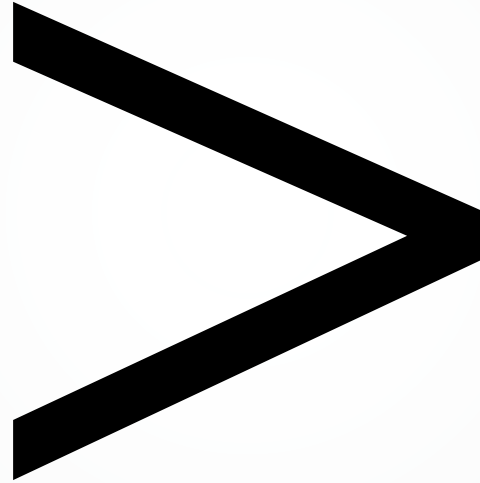
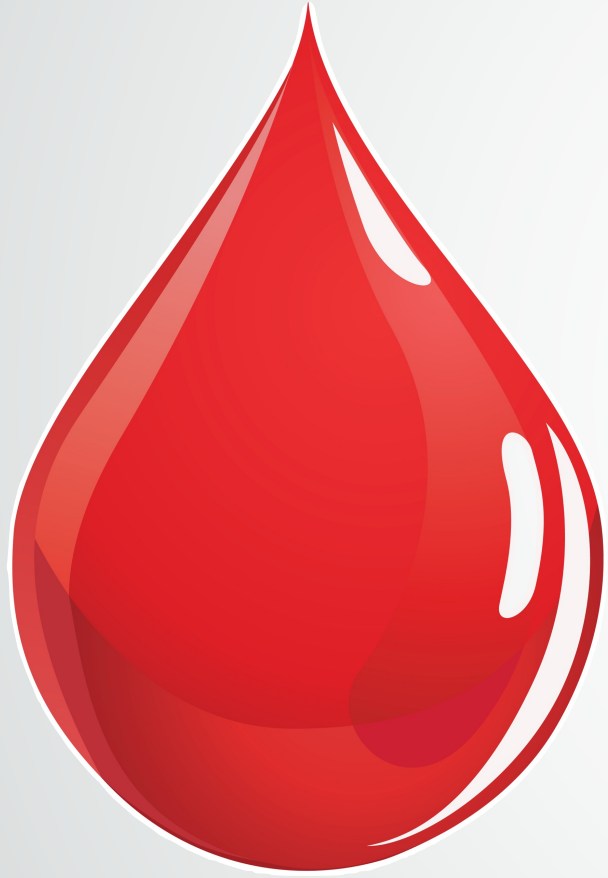


Pressure





Circulation First



Faster Refill in an Urban EMS System Saves Lives:

Prospective Evaluation of Prehospital Advanced Resuscitative Care



ARC = 2u PRBC's + 2g TXA + 2g Ca



Hospital Mortality
ARC vs Usual Care 2021- 2023



Broome JM, Nordham KD, Piehl M, et al. Faster refill in an urban emergency medical services system saves lives: A prospective preliminary evaluation of a prehospital advanced resuscitative care bundle. *J Trauma Acute Care Surg.* 2024;96(5):702-707.

@JTraumaAcuteSurg

Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved

The Journal of
**Trauma and
Acute Care Surgery®**

Faster Refill in an Urban EMS System Saves Lives:

Prospective Evaluation of Prehospital Advanced Resuscitative Care



ARC = 2u PRBC's + 2g TXA + 2g Ca



Hospital Mortality
ARC vs Usual Care 2021- 2023

Design: ARC cases vs controls

Inclusion: Penetrating injury with shock:

SBP < 70

OR

SBP < 90 + HR > 110 (SI 1.2)

Exclusion: Isolated TBI or cardiac arrest

Outcome: interventions, vitals, mortality

Broome JM, Nordham KD, Piehl M, et al. Faster refill in an urban emergency medical services system saves lives: A prospective preliminary evaluation of a prehospital advanced resuscitative care bundle. *J Trauma Acute Care Surg.* 2024;96(5):702-707.

@JTraumaAcuteSurg

Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved

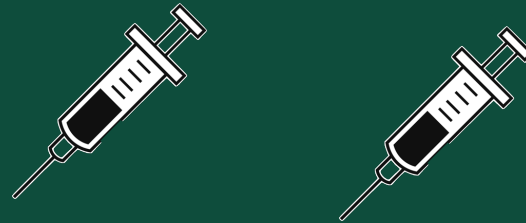
The Journal of
**Trauma and
Acute Care Surgery®**

Faster Refill in an Urban EMS System Saves Lives:

Prospective Evaluation of Prehospital Advanced Resuscitative Care



ARC = 2u PRBC's + 2g TXA + 2g Ca



Hospital Mortality
ARC vs Usual Care 2021- 2023



Shock Index Scene

Usual Care

1.21

ARC

1.44



Shock Index ED

0.87

0.73



Prehospital Time

13 min

16 min



EMS Intubation

12%

1.6%

Broome JM, Nordham KD, Piehl M, et al. Faster refill in an urban emergency medical services system saves lives: A prospective preliminary evaluation of a prehospital advanced resuscitative care bundle. *J Trauma Acute Care Surg.* 2024;96(5):702-707.


@JTraumaAcuteSurg

Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved

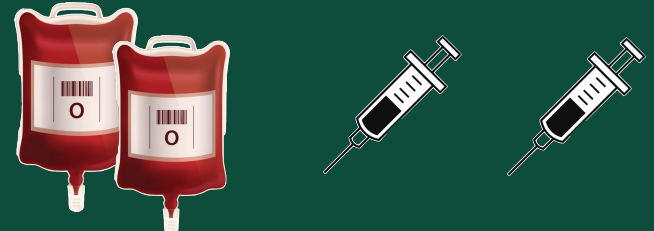

The Journal of
**Trauma and
Acute Care Surgery®**

Faster Refill in an Urban EMS System Saves Lives:





Prospective Evaluation of Prehospital Advanced Resuscitative Care




ARC = 2u PRBC's + 2g TXA + 2g Ca

**Hospital Mortality
ARC vs Usual Care
2021- 2023**


	Usual Care (N = 149)	ARC (N = 61)
 SI Scene	1.21	1.44
 SI ED	0.87	0.73
 Prehospital Time	13 min	16 min
 EMS Intubation	12%	1.6%

In-Hospital Mortality



Usual Care **25.5%**

ARC **11.5%**



= Lives Saved

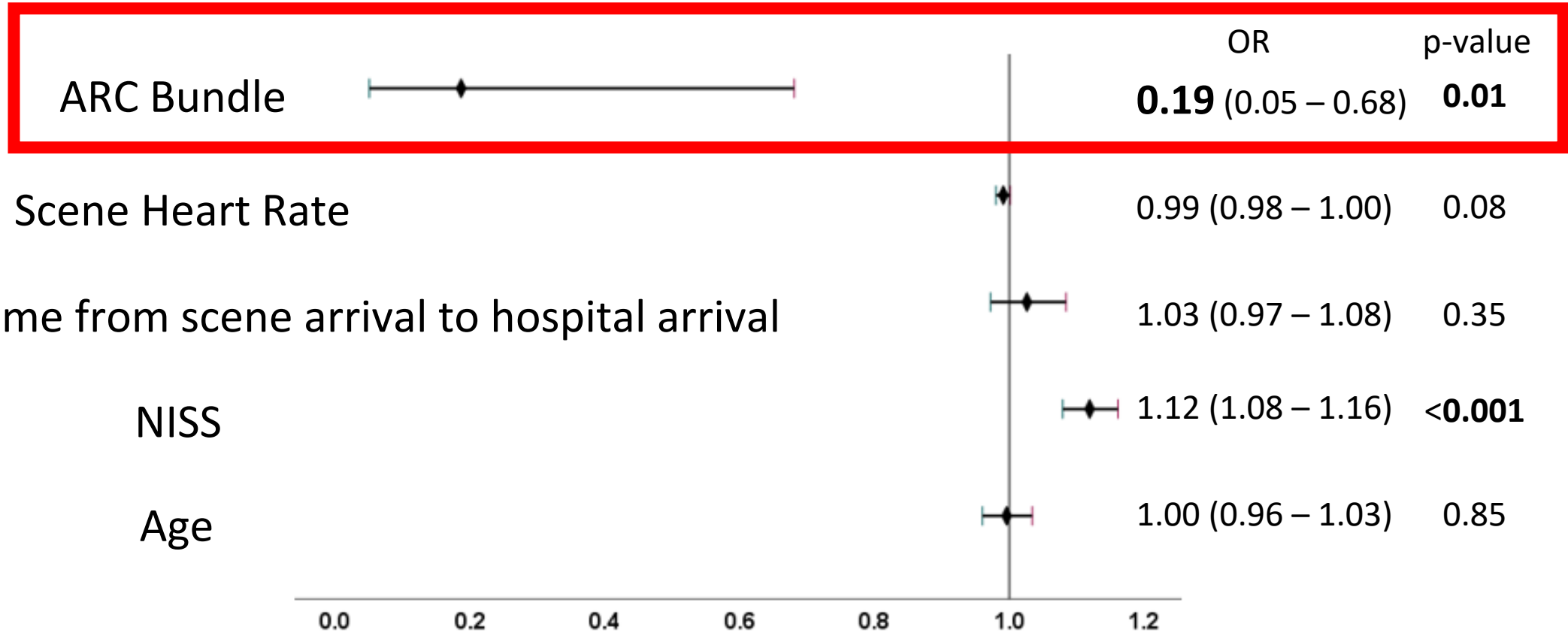
Broome JM, Nordham KD, Piehl M, et al. Faster refill in an urban emergency medical services system saves lives: A prospective preliminary evaluation of a prehospital advanced resuscitative care bundle. *J Trauma Acute Care Surg.* 2024;96(5):702-707.

Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved

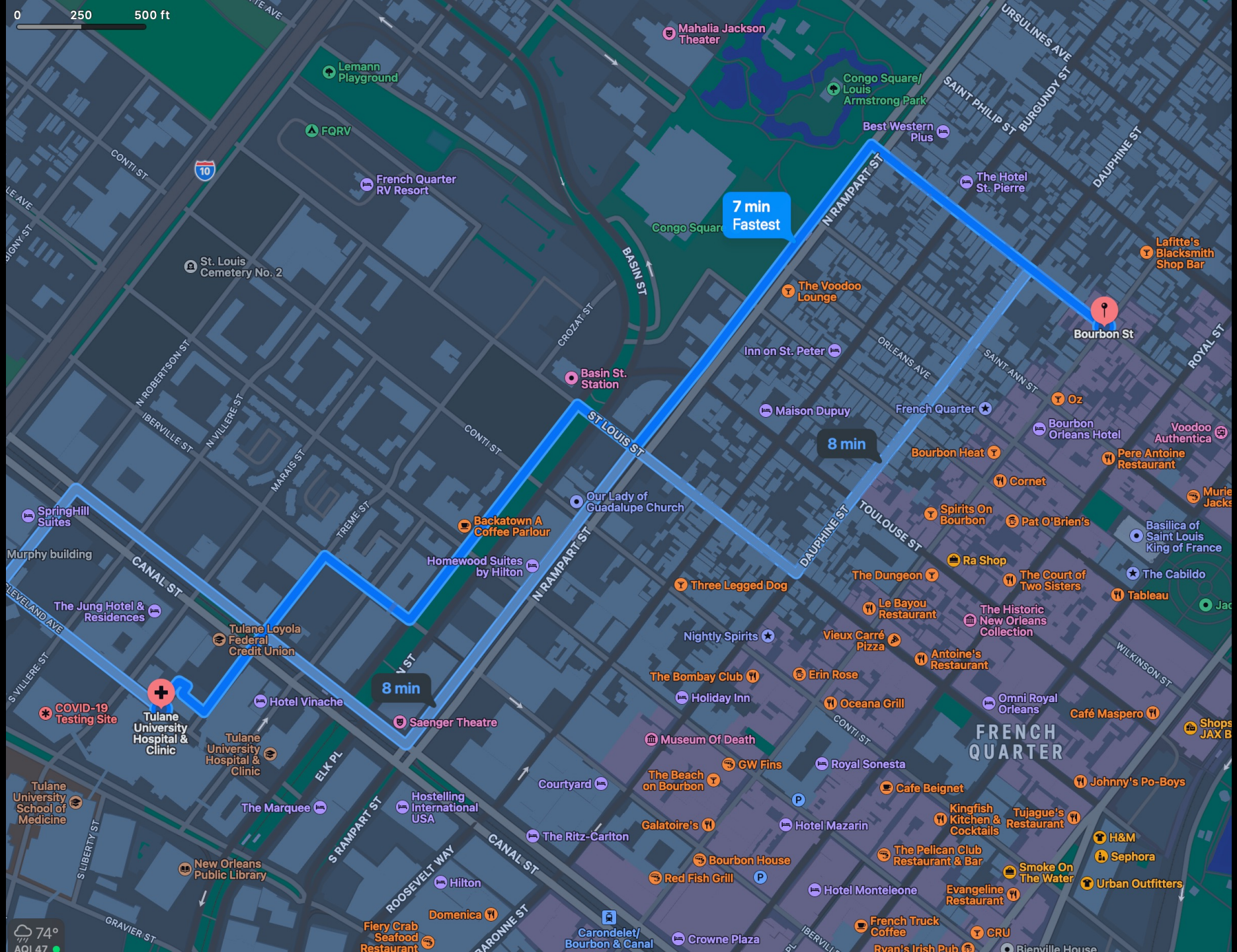
The Journal of
**Trauma and
Acute Care Surgery®**

@JTraumaAcuteSurg

Factors Associated with Mortality Among Adults with Penetrating Torso Trauma and Shock



0 250 500 ft



7 min
Fastest

8 min

8 min

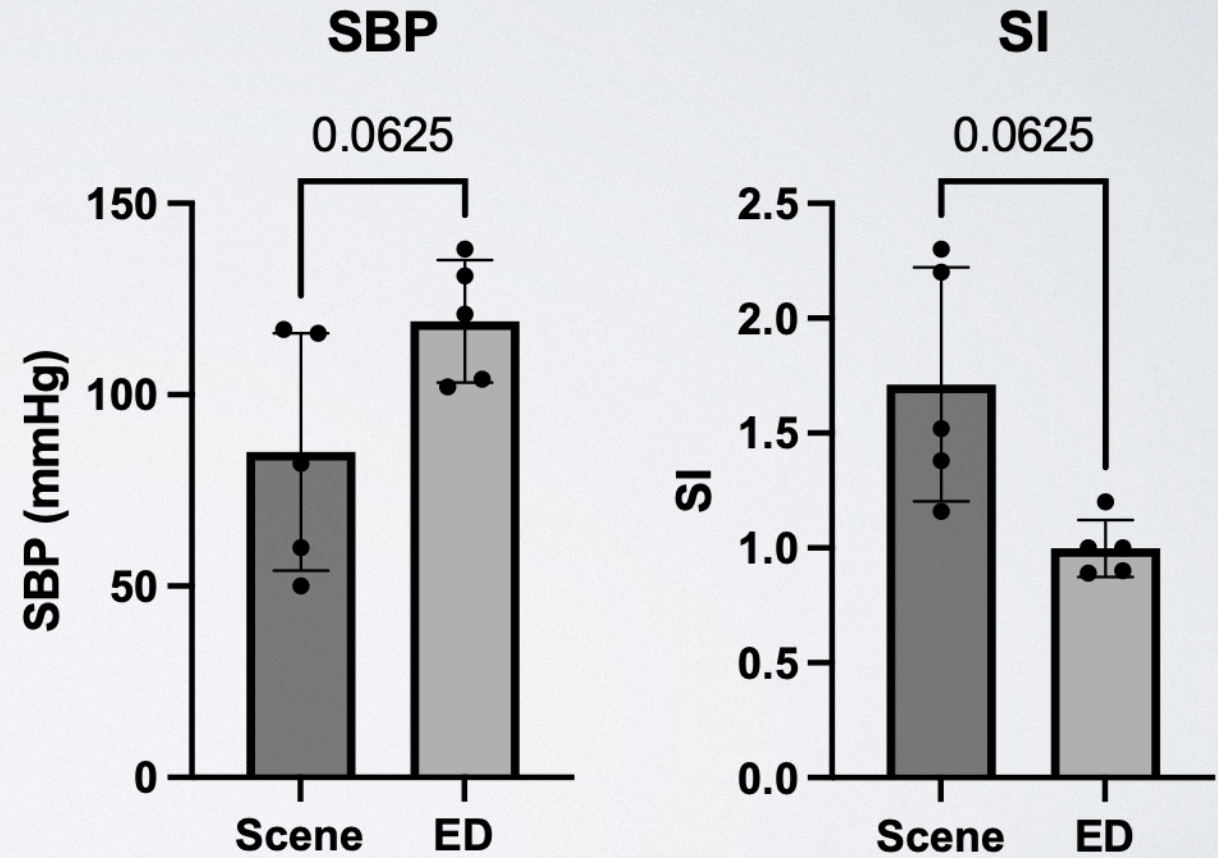
74°
AQ147



Pediatric Case Series: Prehospital Advanced Resuscitative Care (ARC) Bundle



- 13 patients eligible
 - 3 field arrest (excluded)
 - 1 isolated TBI (excluded)
 - 9 patients included
- 8-18 years
- All survived to discharge



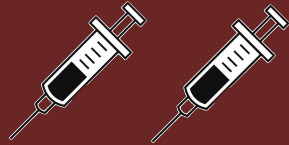
Every Minute Matters:

Extending the Continuum of Care Through Early Prehospital Blood

Study Population



PHB = 2u PRBC's + 2g TXA + 2g Ca



Time to blood
PHB vs Usual Care



Results

PHB



8 mins

Controls



26 mins



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, Broome JM, Piehl M 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



911 Call

February 2024









First SPARC Academy March 12 2024



SPARC

ACADEMY

Saving Lives with Hemorrhage Control and Blood

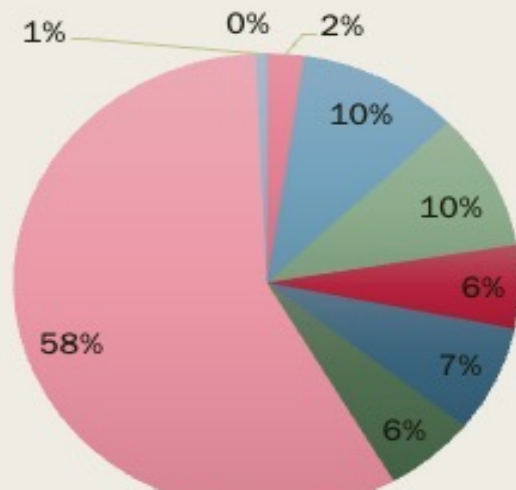
Second SPARC Academy
June 11, 2024
#SPARC2024



SPARC REGISTRY

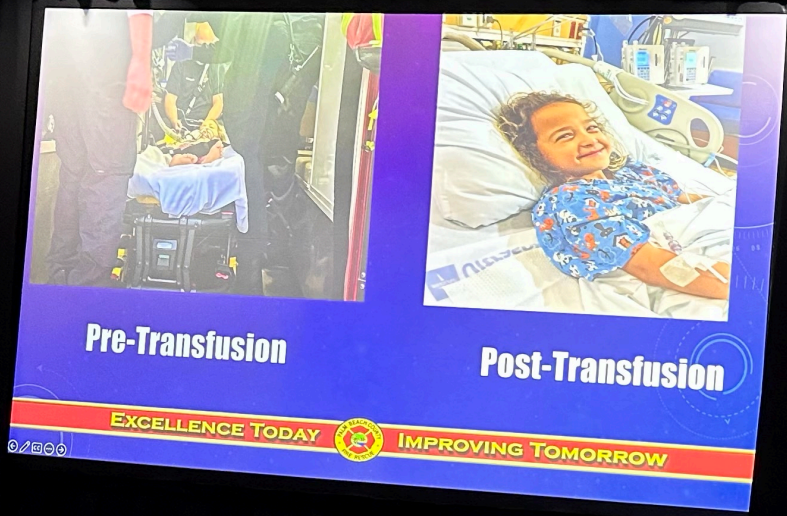
REDCap Entries

- 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






SPARC
@SPARC2024 |

SPARC
@SPARC2024

Follow

An illustration of a red blood bag with a white label featuring a red blood drop and a bar chart. A red tube is connected to the bottom of the bag and loops around. The background is a dark blue gradient with faint white circular patterns and numerical scales (140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 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

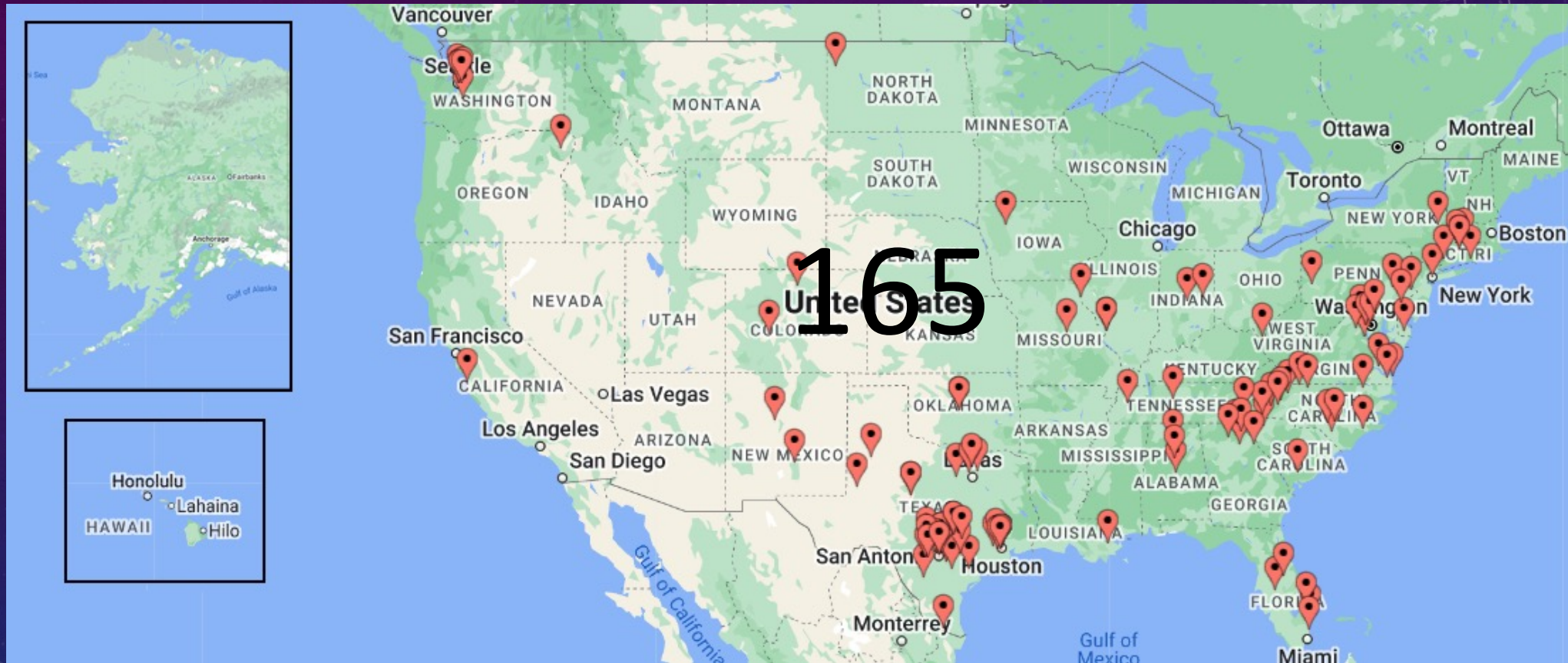
Military has been doing it for over 20 years with success

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

Varies depending on product availability

Unknown 4%

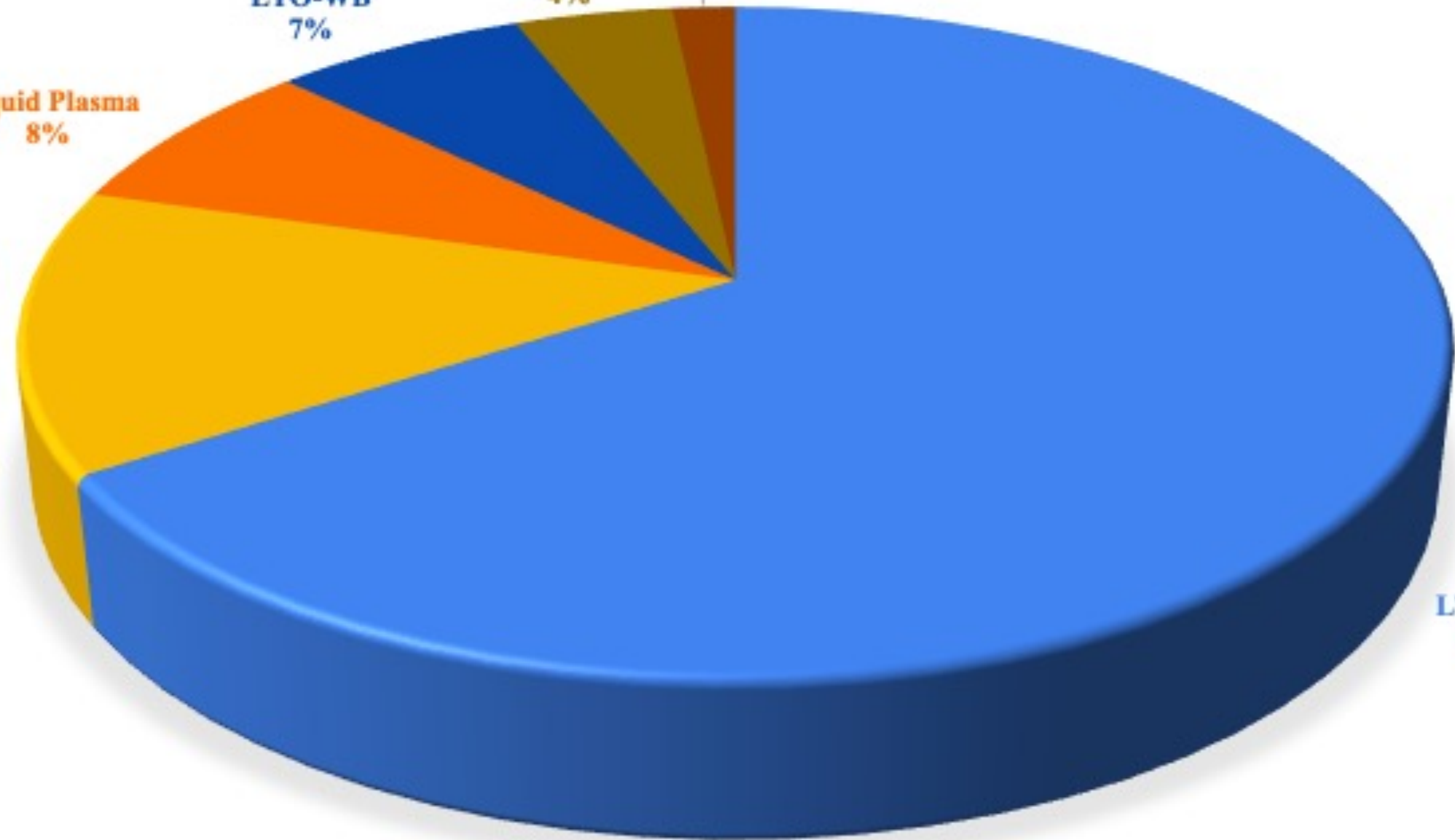
2%

LTO-WB 7%

Liquid Plasma 8%

PRBCS 13%

LTO+WB 66%





*Do It
For Jaylon*



WHOLE BLOOD COALITION



*Leviticus 17:11;
For the life of the flesh is in the blood*



A Federal Movement

Dr. Jon Krohmer

Immediate Past Director of the Office of
EMS (NHTSA)



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

John Holcomb, MD, FACS

[Support Us](#)

[Play Video](#)





UNMANNED AIR SYSTEM DEPLOYMENT AND SERVICES



Pre-hospital trauma resuscitation



Peter Antevy, MD

EMS Medical Director – DFR, CSPFD, PBCFR
Pediatric Emergency Medicine, JDCH
@HandtevyMD



Mark Piehl, MD, MPH

Pediatric Critical Care
WakeMed – Raleigh, NC
@MarkPiehl



David Spiro, MD

Pediatric Emergency Medicine
Chief Medical Officer, Reel Dx
@ReelDx



Designee Discussion

Whole Blood in EMS

*"For the life of the flesh is in the blood.."
Leviticus 17:11*



Center for
Public Safety
Excellence



Peter Antevy, MD

EMS Medical Director, PEM Physician
Peter@Handtevy.com



R&D (Rip-off & Duplicate)



Connect with me:
Peter@Handtevy.com
[@HandtevyMD](#) 