



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION

# Prehospital Blood Transfusion Initiative Coalition

National EMS Advisory Council  
August 9, 2023



- 1520** Welcome Jon R. Krohmer, MD, FACEP, FAEMS
- 1525** Overview of PHBTIC Strategy and Objectives Bill Skillman
- 1530** The Case For Prehospital Transfusion John Holcomb, MD, FACS
- 1545** Field Experience : HCESD 48 Fire Dept. Eric A. Bank, , LP, NRP, FAEMS
- 1555** Reimbursement Efforts To Date Susan N. Leppke, MPH
- 1600** Current Status of EMS Blood Programs Randall Schaefer, DNP, RN, ACNS-BC, CEN
- 1605** Coalition Development Jon Krohmer, MD, FACEP, FAEMS





Among the 1504 patients, every 1-minute delay in prehospital resuscitation was associated with 2% increase in the odds of 30d mortality ( $p=0.03$ ).

Bleeding patients need resuscitation initiated early



# Overview: Prehospital Blood Transfusion Initiative Coalition Vision, Strategy and Objectives

Bill Skillman  
SVP,  
Velico Medical, Inc.



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION

Exsanguination remains the leading cause of preventable deaths among victims of trauma with nearly half of these patients dying in the prehospital setting.<sup>1,2</sup>

Prehospital blood resuscitation is also clinically indicated for selected patients who hemorrhage from medical conditions (e.g., post-partum hemorrhage, abdominal bleeds) potentially doubling the number of patients who would benefit from field transfusions.

Individuals requiring blood transfusions in the field in most locations in the US do not have access to pre-hospital blood transfusions due to inadequate reimbursement policies and state by state scope of practice limitations.

1. Sperry JL, et al. Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock. *N Engl J Med*. 2018 Jul 26;379(4):315-326.
2. Tompeck AJ, et al. A comprehensive review of topical hemostatic agents: The good, the bad, and the novel. *Journal of Trauma and Acute Care Surgery* 88(1):p e1-e21, January 2020.



Vision:

Prehospital blood products available to every medically appropriate bleeding patient;

Appropriate reimbursement to every provider

Mission:

Establish reimbursement coverage, from both government and commercial payors, for prehospital blood transfusions and

Ensure prehospital blood transfusion is included appropriately in the prehospital clinical scope of practice in all states and jurisdictions across the United States.



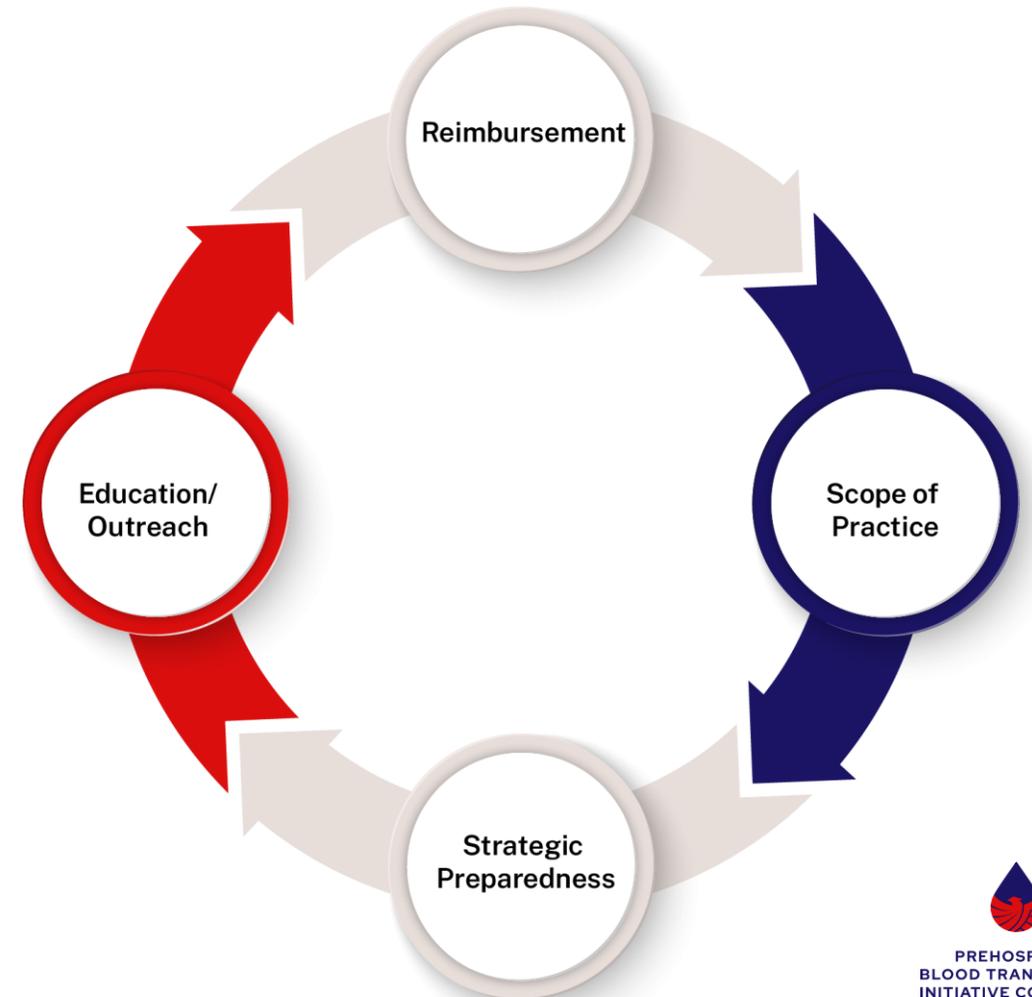
Build an industry-wide, collaborative initiative including medical groups, EMS trade associations, blood collectors

Elevate Federal awareness of the importance of prehospital transfusion

Drive Congressional support for reimbursement and scope of practice initiatives

Deliver a call to action for CMS and commercial payors

Build nationwide awareness of the critical importance of blood on board emergency vehicles



**John Holcomb, MD, FACS**

COL (Retired) US Army  
Professor of Surgery, University of Alabama at Birmingham  
Uniformed Services University of the Health Sciences, Bethesda, MD

**Eric A. Bank, LP, NRP**

Assistant Chief of EMS  
HCDESD 48

**Susan N. Leppke, MPH**

Senior Director, Public Policy & Strategic Partnerships  
Association for the Advancement of Blood and Biotherapies (AABB)

**Leah Mendelsohn Stone**

Vice President, Public Policy and Advocacy  
Association for the Advancement of Blood and Biotherapies (AABB)

**Jon Krohmer, MD**

EMS SME Consultant, Velico Medical  
Former Director, National Highway Traffic Safety Administration (NHTSA), Office of EMS

**Randall Schaefer, DNP, RN, ACNS-BC, CEN**

CEO, Schaefer Consulting, LLC

**Mary J Homer, PhD**

Chief, Radiological and Nuclear Countermeasures, Division of Chemical, Biological, Radiological, and Nuclear Countermeasures  
Biomedical Advanced Research and Development Authority (BARDA), Administration for Strategic Preparedness and Response  
Department of Health and Human Services

**Ciaran Flanagan**

Chief Commercial Officer, Velico Medical

**Bill Skillman**

Senior Vice President, Velico Medical



# The Case For Prehospital Blood Transfusion

John B. Holcomb, MD, FACS

COL (Ret) US Army

Professor of Surgery

University of Alabama at Birmingham and

Uniformed Services University of the Health Sciences, Bethesda MD



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**

- Mil background WW1-WWII
- Crystalloid
- Mil again
- Hospital data
- Prehospital data
  - Funded by DoD
- Endorsement by .....





FIGURE 159.—Administration of plasma on beach, only few feet from surf, to survivor of landing craft sunk off coast in first days of invasion of Normandy, June 1944.

J Trauma, 2007.

## Damage Control Resuscitation: Directly Addressing the Early Coagulopathy of Trauma

*John B. Holcomb, MD, FACS, Don Jenkins, MD, FACS, Peter Rhee, MD, FACS, Jay Johannigman, MD, FS, FACS, Peter Mahoney, FRCA, RAMC, Sumeru Mehta, MD, E. Darrin Cox, MD, FACS, Michael J. Gehrke, MD, Greg J. Beilman, MD, FACS, Martin Schreiber, MD, FACS, Stephen F. Flaherty, MD, FACS, Kurt W. Grathwohl, MD, Phillip C. Spinella, MD, Jeremy G. Perkins, MD, Alec C. Beekley, MD, FACS, Neil R. McMullin, MD, Myung S. Park, MD, FACS, Ernest A. Gonzalez, MD, FACS, Charles E. Wade, PhD, Michael A. Dubick, PhD, C. William Schwab, MD, FACS, Fred A. Moore, MD, FACS, Howard R. Champion, FRCS, David B. Hoyt, MD, FACS, and John R. Hess, MD, MPH, FACP*

- Rapid progress in trauma care occurs during a war.
- Damage control resuscitation addresses diagnosis and treatment of the entire lethal triad immediately upon admission.

- Stop bleeding
- Hypotensive resuscitation
- Minimize crystalloid
- 1:1:1 or whole blood
- Use plasma as the 1<sup>o</sup> resuscitation fluid
- Increased platelet use
- Reverse hypothermia and acidosis
- Hemostatic adjuncts

# Fluid Resuscitation for Hemorrhagic Shock in Tactical Combat Casualty Care

*TCCC Guidelines Change 14-01 – 2 June 2014*

## Conclusions

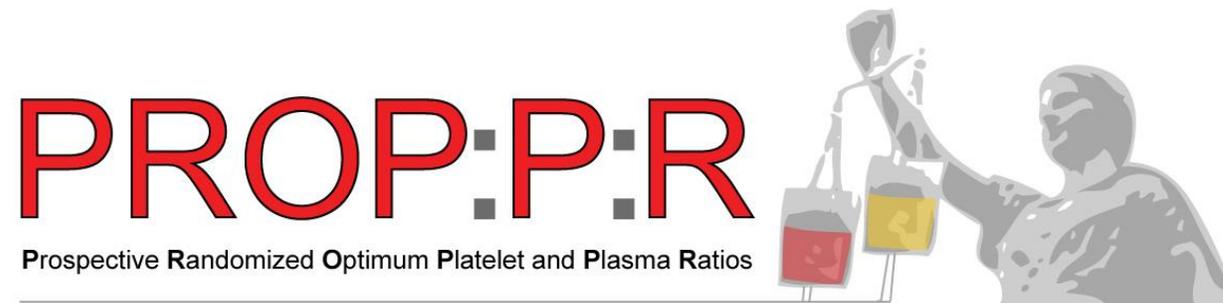
1. The preferred fluids for resuscitation of casualties in hemorrhagic shock, in descending order of preference, are:
  - Whole blood
  - 1:1:1 plasma, RBCs, and platelets
  - 1:1 plasma and RBCs
  - Reconstituted DP, liquid plasma, or thawed plasma alone or RBCs alone
  - Hextend
  - LR or Plasma-Lyte A



Lots of  
work  
over a  
long  
time by  
lots  
of people,  
Funded  
by DoD  
and NIH



## Whole Blood vs Components Study Frozen Blood vs Stored Blood



# Damage control resuscitation in patients with severe traumatic hemorrhage: A practice management guideline from the Eastern Association for the Surgery of Trauma

J Trauma 2017

Jeremy W. Cannon, MD, SM, Mansoor A. Khan, MBBS (Lond), PhD, Ali S. Raja, MD, Mitchell J. Cohen, MD, John J. Como, MD, MPH, Bryan A. Cotton, MD, Joseph J. Dubose, MD, Erin E. Fox, PhD, Kenji Inaba, MD, Carlos J. Rodriguez, DO, John B. Holcomb, MD, and Juan C. Duchesne, MD, Philadelphia, Pennsylvania

- DCR significantly improve outcomes in severely injured bleeding patients.
- After a review of the best available evidence, we recommend the use of a MT/DCR protocol in hospitals that manage such patients and recommend that the protocol target a high ratio of PLAS and PLT to RBC.
- This is best achieved by transfusing equal amounts of RBC, PLAS, and PLT during the early, empiric phase of resuscitation.

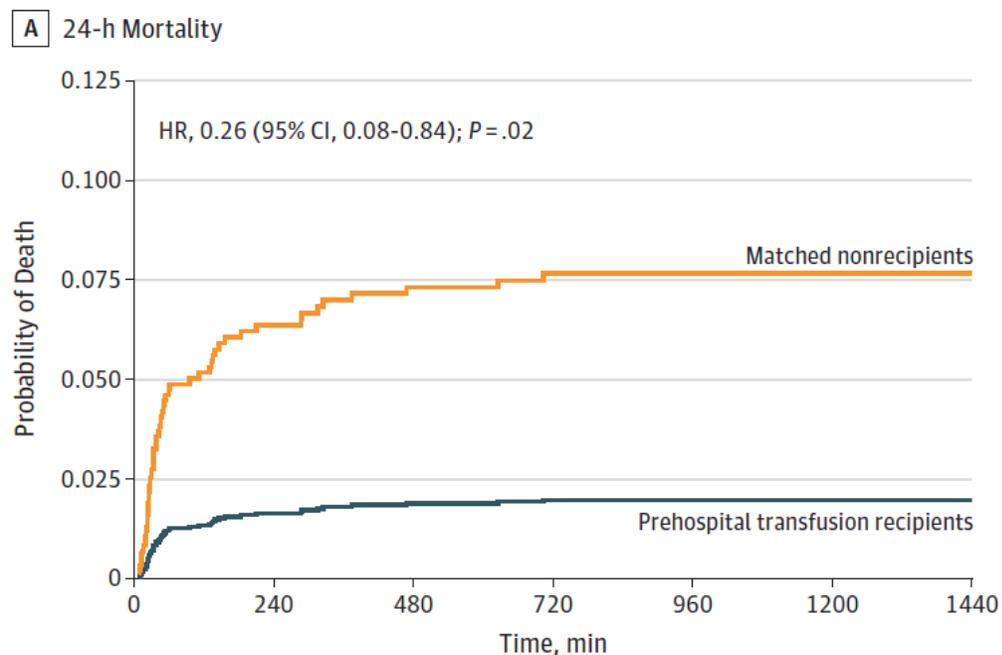


# Association of Prehospital Blood Product Transfusion During Medical Evacuation of Combat Casualties in Afghanistan With Acute and 30-Day Survival

JAMA, 2017

Stacy A. Shackelford, MD; Deborah J. del Junco, PhD; Nicole Powell-Dunford, MD; Edward L. Mazuchowski, MD, PhD; Jeffrey T. Howard, PhD; Russ S. Kotwal, MD, MPH; Jennifer Gurney, MD; Frank K. Butler Jr, MD; Kirby Gross, MD; Zsolt T. Stockinger, MD

- “Prehospital blood product transfusion in trauma care remains controversial due to poor-quality evidence and cost”



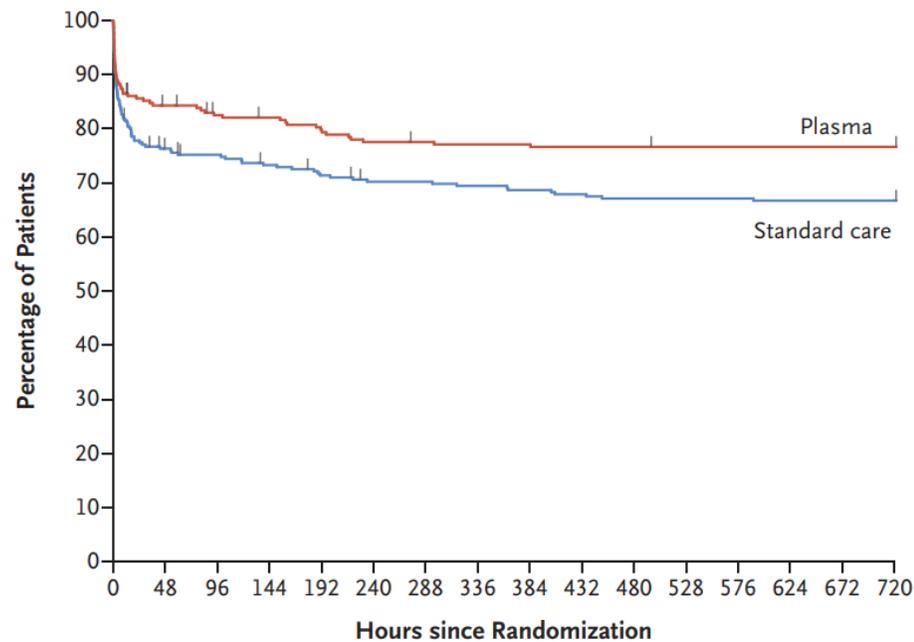
N = 505

5 vs 19% 24 hr mortality

11 vs 23% 30 day mortality

# Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock

J.L. Sperry, F.X. Guyette, J.B. Brown, M.H. Yazer, D.J. Triulzi, B.J. Early-Young, P.W. Adams, B.J. Daley, R.S. Miller, B.G. Harbrecht, J.A. Claridge, H.A. Phelan, W.R. Witham, A.T. Putnam, T.M. Duane, L.H. Alarcon, C.W. Callaway, B.S. Zuckerbraun, M.D. Neal, M.R. Rosengart, R.M. Forsythe, T.R. Billiar, D.M. Yealy, A.B. Peitzman, and M.S. Zenati, for the PAMPer Study Group\* NEJM 2018



N = 564 at 9 sites

23% vs 33% 30 day survival, p = 0.02

Diff at 3 hours, Including TBI

No. at Risk	0	48	96	144	192	240	288	336	384	432	480	528	576	624	672	720
Plasma	230	183	172	170	169	168	168	168	168	168	168	168	168	168	168	168
Standard care	271	194	181	179	173	172	172	172	172	172	172	172	172	172	172	172



90 cents

Vs

versus



\$500

THE CELLULAR, METABOLIC, AND SYSTEMIC CONSEQUENCES OF  
AGGRESSIVE FLUID RESUSCITATION STRATEGIES

Bryan A. Cotton, Jeffrey S. Guy, John A. Morris Jr, and Najj N. Abumrad

*Department of General Surgery, Vanderbilt University School of Medicine, Nashville, TN*

- McClelland RN, Shires GT, Baxter CR, Coln CD, Carrico CJ. Balanced salt solution in the treatment of hemorrhagic shock. *JAMA*. 1967.
- **FD Moore, Shires G. Moderation. *Annals of Surg*. 1968.**
- Bickell WH, et al. Immediate versus delayed fluid resuscitation for hypotensive patients with penetrating torso injuries. *NEJM*. 1994.
- Rhee et al. Human neutrophil activation and increased adhesion by various resuscitation fluids. *Crit Care Med*. 2000.
- Brandstrup B, et al. Effects of IV fluid restriction on postop complications: a comparison of two perioperative fluid regimens. *Annals of Surg*, 2003.
- NHLBI ARDS NET Clinical Trials Network; Wiedemann HP, et al. Comparison of two fluid-management strategies in acute lung injury. *NEJM* 2006.

PREHOSPITAL CRYSTALLOID RESUSCITATION: PRACTICE VARIATION  
AND ASSOCIATIONS WITH CLINICAL OUTCOMES

Shock 2023

Michael B. Weykamp,\* Katherine E. Stern,<sup>†</sup> Scott C. Brakenridge,\*  
Bryce R.H. Robinson,\* Charles E. Wade,<sup>‡</sup> Erin E. Fox,<sup>‡</sup>  
John B. Holcomb,<sup>§</sup> and Grant E. O'Keefe\*

- Although resuscitation guidelines for injured patients favor blood products, crystalloid resuscitation remains a mainstay in prehospital care.
- Secondary study of the PROPPR data, N= 680
- In regression analyses, each 500 mL of PHC was associated with increased ARDS, INR and PTT, and decreased hematocrit and platelet count (P < 0.05).
- Prehospital resuscitation with crystalloid is highly variable across the US and correlates poorly with prehospital hemodynamics and injury characteristics.
- Increased PHC volume is associated with greater anemia, coagulopathy, and increased risk of ARDS



## Whole truths but half the blood: Addressing the gap between the evidence and practice of pre-hospital and in-hospital blood product use for trauma resuscitation

Zain G. Hashmi<sup>1,2</sup>  | Mohamad Chehab<sup>3</sup> | Avery B. Nathens<sup>4</sup> |  
Bellal Joseph<sup>3</sup> | Eric A. Bank<sup>5</sup> | Jan O. Jansen<sup>1,2</sup>  | John B. Holcomb<sup>1,2</sup> 

- The National Emergency Medical Services Information System (NEMSIS) 2019 dataset was used to characterize prehospital blood product use among trauma patients. (n = 3,059,117)
- The American College of Surgeons (ACS) Trauma Quality Programs (TQP) was used to calculate the proportion of ACS-verified trauma centers using whole blood (100% have components immediately available).
- Only 208 (0.21%) of all hypotensive trauma patients received any blood product in the pre-hospital setting
- ACS-verified trauma centers transfusing whole blood was 24.5% (123/502) in first quarter of 2020.



# THOR-AABB WORKING PARTY RECOMMENDATIONS FOR A PREHOSPITAL BLOOD PRODUCT TRANSFUSION PROGRAM

Mark H. Yazer, Philip C. Spinella, Eric A. Bank, Jeremy W. Cannon, Nancy M. Dunbar,  
John B. Holcomb, Bryon P. Jackson, Donald Jenkins, Michael Levy, Paul E. Pepe, Jason L.  
Sperry, James R. Stubbs, and Christopher J. Winckler

- Comprehensive, “Why and How to do” a prehospital blood program
- Blood bankers, Surgeons, EM physicians, EMS clinicians
  - Safety, credentialing, reporting
  - Rationale for the use and description of blood products that can be transfused in the prehospital setting,
  - Storage of blood products outside of the hospital blood bank
  - Prehospital transfusion criteria and administration
  - Documentation of prehospital transfusion and hand over to the hospital team.



**It is time to reconsider the risks of transfusing RhD negative females of childbearing potential with RhD positive red blood cells in bleeding emergencies**

*Mark H. Yazer<sup>1,2</sup>, Meghan Delaney<sup>3,4</sup>, Heidi Doughty<sup>5</sup>, Nancy M. Dunbar<sup>6</sup>, Arwa Z. Al-Riyami<sup>7</sup>, Darrell J. Triulzi<sup>1,2</sup>, Jon F. Watchko<sup>8</sup>, Erica M. Wood<sup>9,10</sup>, Vered Yahalom<sup>11</sup> and Stephen P. Emery<sup>12</sup>*

- Conventional teaching has been that females whose RhD (D) type is either unknown or who are D- should receive only D- blood products.
- The concern has been that a D- female who is exposed to D+ blood could become alloimmunized to the D antigen with the potential for loss of a future D+ fetus through hemolytic disease of the fetus and newborn.
- But D- is a minority of blood available for transfusion
- Must balance the death rate after massive transfusion (25%) with the alloimmunization rate (21%)
- Death rate of a fetus after alloimmunization (4%)
- Massively bleeding D- females, or those of unknown D type, should not be denied lifesaving blood



The females have spoken. A patient-centered national survey on the administration of emergent transfusions with the potential for future fetal harm

Uhlich R, Hu Parker, Yazer M, Jansen J, Patrician P, Marques M, Reynolds L, Fifolt M, Stephens S, Gelbard R, Kerby J, Holcomb JB

- Performed a national survey using Facebook advertisements in three waves in 2021.
- Asked 4 questions on accepting transfusion with differing probabilities for future fetal harm
- Advertisements were viewed 16,600,430 times by 2,169,805 people with 2,873 surveys initiated and 2256 (79%) fully completed.
- Most females responded “likely” or “neutral” when asked whether they would accept a lifesaving transfusion if the following risk of fetal harm were present:
  - no risk (99%); 1:10,000 risk (92%), 1:100 risk (85%); any risk (83%).
- This national survey suggests that most females would accept lifesaving transfusion even with the risk of future fetal harm.



# Nationwide estimates of the need for prehospital blood products after injury

Zain G. Hashmi<sup>1,2</sup>  | Jan O. Jansen<sup>1,2</sup>  | Jeffrey D. Kerby<sup>1,2</sup> |  
John B. Holcomb<sup>1,2</sup> 

- Prehospital blood product resuscitation after injury significantly decreases risk of mortality. However, the number of patients who may potentially benefit from this life-saving intervention is currently unknown.
- Patients  $\geq 16$  years with blunt/penetrating injuries included in National Emergency Medical Services Information System 2019 were identified and classified according to hemodynamic instability.
  - 3.7 million adult trauma patients were reviewed and 54,160 met the strictest criteria
- Assuming 1 unit of whole blood (or equivalent) is needed per patient, a lower-bound estimate of 54,160 additional whole blood units (0.6% of current collections) will be need for optimal prehospital resuscitation of seriously injured patients



American College of Surgeons Committee on Trauma, the American College of Emergency Physicians, and the National Association of EMS Physicians.

1. Stop all compressible hemorrhage

2. Patients with signs of hemorrhagic shock should receive prehospital blood products whenever available.

- Establish a prehospital transfusion protocol utilizing a multi-specialty collaborative approach including both field and hospital clinicians.

# Field Experience: HCESD 48 Fire Department

Eric A. Bank, LP, NRP, FAEMS

Assistant Chief of EMS

HCESD 48 Fire Department

Adjunct Faculty UT Health Houston, Emergency Medicine

Section of Prehospital and Disaster Medicine

AABB THOR Working Group



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**

# Disclosures

1. No Financial Disclosures
2. I do mention certain products used by HCESD 48  
but don't endorse or receive any financial  
compensation from them



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**

# Harris County ESD 48 Fire Department

- Suburban West Houston
- 55 Square Miles
- Population of 175,000
- 12,000 calls per year
- 6 Ambulances with 1 EMS Supervisor
- Dr. David Reininger, MD Medical Director
- Dr. Joseph Gill, MD Assoc. Medical Director



Red Duke  
Trauma Institute  
MEMORIAL  
HERMANN



Memorial Hermann Busiest Level -1 Trauma  
Center in the US

29 miles or 45 minutes away with no traffic

- We can't control the uncontrollable
- The event brought us here, we did not choose the event
- We can however bring order to the chaos
- Provide calm direction and care
- Mitigate the circumstances
- Remember overall we can't control the cause, we can dictate the solution



# Turn Back the Clock to 1994

- Respond to an Assault
  - Adult male patient around 30 semi-conscious
  - Skin is Cool, ashen and Diaphoretic
    - HR is 130
    - B/P is 60/systolic
- Injuries
  - Large Laceration R. Upper Abdomen, not bleeding
  - Multiple arm defense wounds, both brachial arteries are cut
  - **What is your treatment plan, now remember it is 1994 !**



# 1990's Trauma Care



# Fast Forward to 2014



- Respond to a Multiple Shooting
  - Adult male patient around 30 semi-conscious
- Skin is Cool, ashen and Diaphoretic
  - HR is 160
  - B/P is 80/systolic and falling
- Injuries
  - Single GSW to the Left Buttocks, transverses lateral to medial and exits left inner thigh
- No active site bleeding
- No Other Injuries

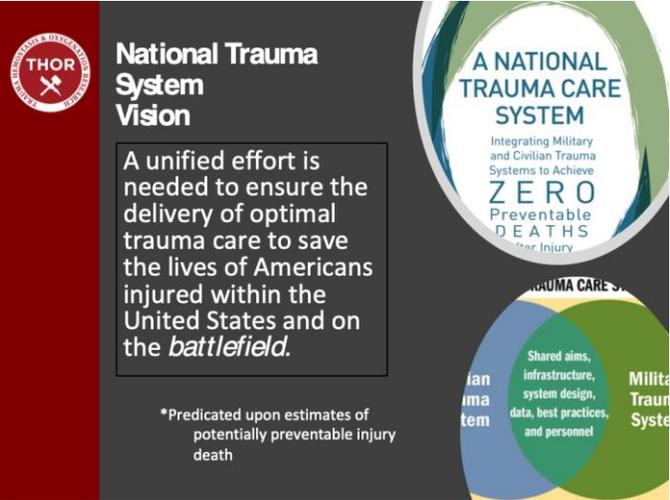


# 2014's Trauma Care





# 2014 The Battle for Pre-Hospital Blood Begins



**THOR**  
TRAUMA OPERATIONS RESEARCH

### National Trauma System Vision

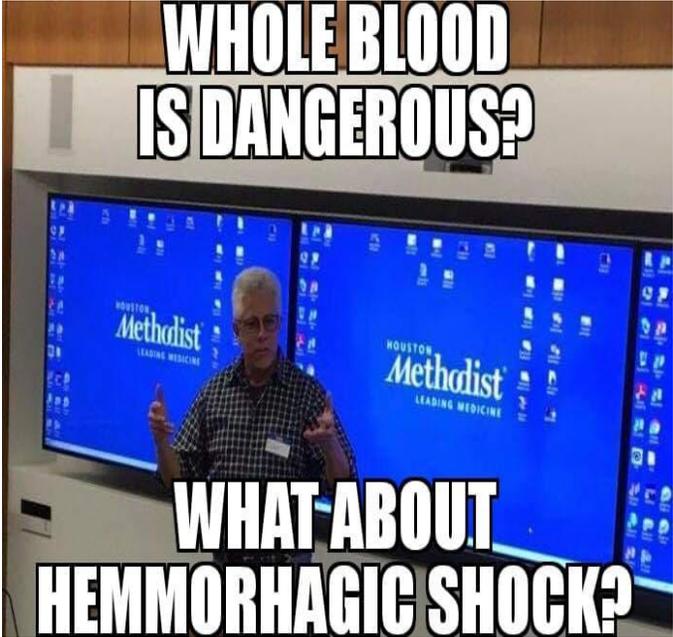
A unified effort is needed to ensure the delivery of optimal trauma care to save the lives of Americans injured within the United States and on the *battlefield*.

\*Predicated upon estimates of potentially preventable injury death

**A NATIONAL TRAUMA CARE SYSTEM**  
Integrating Military and Civilian Trauma Systems to Achieve **ZERO** Preventable DEATHS After Injury

Shared aims, infrastructure, system design, data, best practices, and personnel

ian ma tem      Milita Traun Syste



# From Medical to Logistics

1. Gain medical direction: Through researching local and military studies , our medical directors felt the medicine and science was sound. Texas is a delegated practice state

2. Work with regional hospitals and/or the blood bank for stocking blood products. We use Gulf Coast Regional Blood Center, Thank You Dr. Hartwell !!

3. Develop logistics and Maintenance

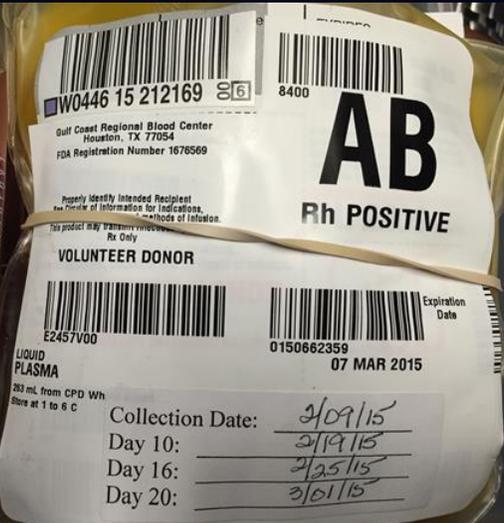
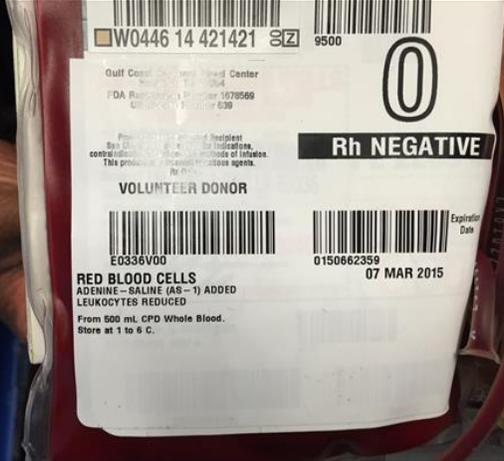
- What are you usage levels and guidelines
- How do you replace it ? (And pay for it)
- How do you hand off a patient at the ED or for Flight
- How do you bill for it

4. Convince and partner your local hospitals and trauma centers

From concept to inception for us was just over a year long project



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION



## Blood Products for Ground EMS

- Used in Military Ops as far back as WWII
- Commonly used later in the Iraq and Afghanistan Theatre,
- Transition to HEMS, Life Flight has utilized for 3 years,
- Request for HCESD 48 use in early 2015
- Deployed for HCESD 48 use in Feb 2016.
- Transitioned to LTO Whole Blood Aug 2017

PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION

## 1. Medical

- Is it the right thing for patient care?
- Paramedic Scope of Practice ?

## 2. Logistics of Daily Operations

- Proper care and cooling of stored and deployed Blood
- Safe Patient administration
- Good Stewards of the Blood Supply

## 3. Logistics of managing blood supply

- Managing donor Side
- Distribution and supply
- Maintaining and effective life cycle of the Blood



- **Scope of Practice**

- Nationally
- State to State
- Paramedic Education

- **Medical**

- Blood Products and Flexibility
- Patient Delivery
- Rural Agencies
- Blood bank and EMS Relationships
- Female Patients
- Transfusion Reactions

- **Blood Supply**

- Availability
- Cost
- Flexibility
- Blood Life Cycle

- **Costs**

- Capital Costs
- Blood Costs
- CMS
- Commercial Insurance
- Hospital Replacement



# Medically Based Haemorrhagic Shock

1. Symptomatic bleeding, regardless of cause needs to be treated
2. We initially added medical guidelines to cover these patient's since we carried blood. What we learned is we treat them 3:1 versus trauma patients
3. GI Bleeds, OB complications and Bleeding
4. So this raised the question of Female Patients and LTOWB transfusions



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**

## First Whole Blood Transfusion September 2017

- We believe First Whole blood Transfusion (Civilian Ground EMS)
  - Mid 30's Female with syncopal episode while shopping, 2 weeks post partum
  - Hemodynamically Unstable HR >120, B/P 70/Systolic, MAP 60
  - Patient is pale, Temp 96.5 with POC lactate of 4.7
  - Difficulty catching her breath
  - Vaginal Bleeding x 2 weeks in Hemorrhagic Shock
- Patient Received 1unit (570ml) of Warmed LTOWB
  - Syncope Resolved
  - Improved Hemodynamics HR 64, B/P 98/Systolic with MAP of 64
  - Skin Color Improved, Temp 97.7



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION





- Commit to change
  - STEMI- Time is muscle
  - Stroke- Time is brain tissue
  - Trauma- Time is blood loss
    - Don't forget medical causes of bleeding
- STOP the Bleed
- Understand the trauma triad and now diamond
- Be the voice of change
- Be flexible , LTOWB is not always available
- Learn the process and seek assistance from others
- Fight like you train
  - Daily Operation
  - MCI and ASHER



# Reimbursement Efforts To Date

Susan N. Leppke, MPH  
Senior Director, Public Policy & Strategic Partnerships  
Association for the Advancement of Blood and  
Biotherapies (AABB)



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**



Advancing Transfusion and Cellular Therapies Worldwide

**Improving Medicare coverage and reimbursement policy for pre-hospital transfusions will improve patient outcomes and quality of care**

**Problem:** Individuals requiring trauma care in the field in many locations in the US do not have access to pre-hospital blood transfusions due to inadequate EMS coverage and reimbursement policies.

**Background:** Traumatic injury as a result of hemorrhage is a leading cause of preventable death in trauma care. Studies have shown that the use of blood products prior to arrival at the hospital significantly improves patient outcomes and long-term survival. Data from randomized controlled trials also indicate that delay in providing blood products increases the risk of mortality in patients with severe traumatic bleeding. The use of pre-hospital blood products is widespread within the deployed Department of Defense trauma system. However, few civilian pre-hospital systems have implemented pre-hospital transfusion programs. While the training and equipment required to safely store and transfuse pre-hospital blood products is not inconsequential, pilot projects in various states have shown that implementation of pre-hospital transfusion programs can be successful.

Unfortunately, reimbursement barriers and the inability to bill for transfusions provided in air or ground ambulances are significant obstacles to the widespread availability of pre-hospital transfusions. Medicare currently reimburses ambulance services through bundled payments under a fee schedule, which vary in amount based on service level. Existing service levels for ground ambulance services include: (1) basic life support (BLS); (2) BLS-Emergency; (3) advanced life support, level 1 (ALS1); (4) ALS1- Emergency; (5) advanced life support, level 2 (ALS2); (6) specialty care transport (SCT); and (7) paramedic intercept.

The payment rates for the existing service levels are far too low to accommodate the cost of providing blood transfusions in the field. SCT is assigned the highest relative value units (RVUs), and therefore receives the highest reimbursement rate. SCT is “the interfacility transportation of a critically injured or ill beneficiary by a ground ambulance vehicle, including the provision of medically necessary supplies and services, at a level of service beyond the scope of the EMT-Paramedic.” Pre-hospital transfusions do not qualify for SCT since they are furnished in the field and are not provided as interfacility transports. Thus, the available reimbursement policies are inadequate to cover pre-hospital transfusions.

**Solution:** AABB proposes to work with the pre-hospital provider community to explore and advance Medicare coverage and reimbursement policies that promote patients’ access to pre-hospital transfusions. We intend to explore solutions such as... We intend to explore solutions such as... We intend to explore solutions such as...

- In 2020, worked with the EMS community to explore multiple options for payer coverage and reimbursement.
- Worked with a few organizations on draft language for addition to congressional bills.
  - No movement on bill language.
- In 2023, AABB, ABC, and ARC responded to RFI requests on the Pandemic and All-Hazards Preparedness (PAHPA) reauthorization
  - Language from comments added to Senate version of PAHPA bill.



PREHOSPITAL BLOOD TRANSFUSION INITIATIVE COALITION

- In 2021, AABB proposed a service delivery and payment/reimbursement to the CMS Innovation Center (CMMI).
  - Not selected due to the launch of a new CMMI organizational strategy.
- EMS Community
  - Outcomes and other research
  - THOR-AABB Working Party Recommendations for a Prehospital Blood Product Transfusion Program
- AABB
  - Standards development
- ABC
  - Scope of practice issues research



# Current status of blood programs

Randall Schaefer, DNP, RN, ACNS-BC, CEN  
CEO, Schaefer Consulting, LLC



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION

- We don't really know.
  - No centralized reporting processes
- What we do know:
  - Prehospital blood allowed by HEMS in all 50 states
  - 112 Ground Agencies
    - 37% Fire-Based EMS
    - 42% Third Service
    - 21% Miscellaneous
  - Ground Blood/Blood Products Type
    - 68% LTO+WB
    - 9% LTO-WB
    - 10% PRBC
    - 8% Plasma
    - 5% Unknown



# Coalition Discussion

Jon R. Krohmer, MD  
EMS SME Consultant  
Velico Medical, Inc.



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**

Blood Products

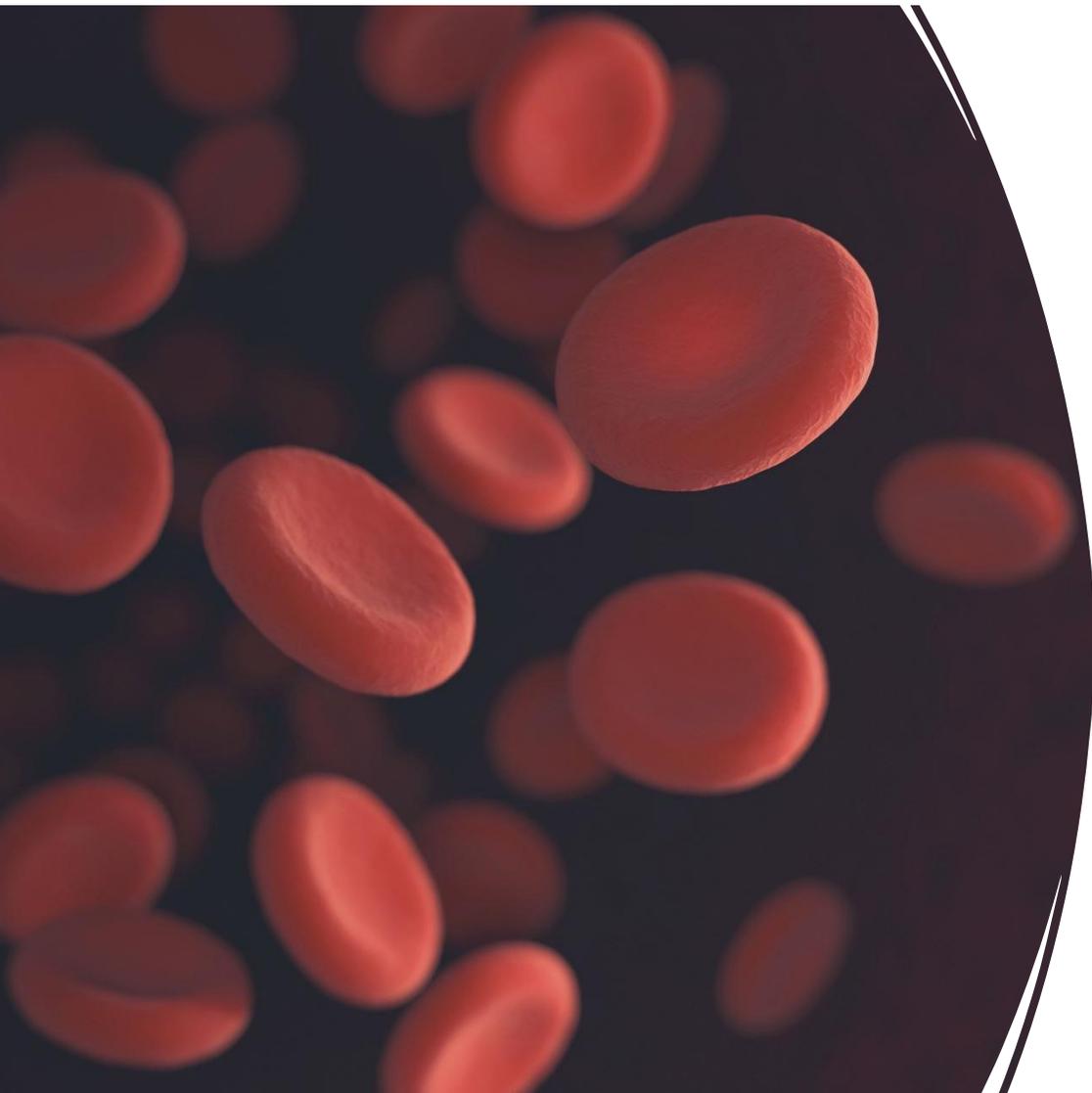
Clinical Considerations

Logistics / Financial Considerations

Funding Considerations

Coalition Building





- Whole Blood
- Packed Red Blood Cells
- Plasma



## Indications

Trauma  
Medical  
OB



## Scope of Practice

State / regional / local oversight  
issues  
Education / Continuing Education



## Administration

Right Patient - Right Indications -  
Right Administration



## Supplies Availability and Cost

- Blood Products
  - Hospital Blood Banks
  - Community / Regional Blood Centers
  - Alternatives?
- Storage Capabilities - station and vehicles
  - Product Rotation
- Administration supplies

## Blood Management in the Field

## Record-keeping

- Blood Supply side
- EMS side - tracking / temperature recording
- Administration

## Getting to the patient



Purchase from the suppliers

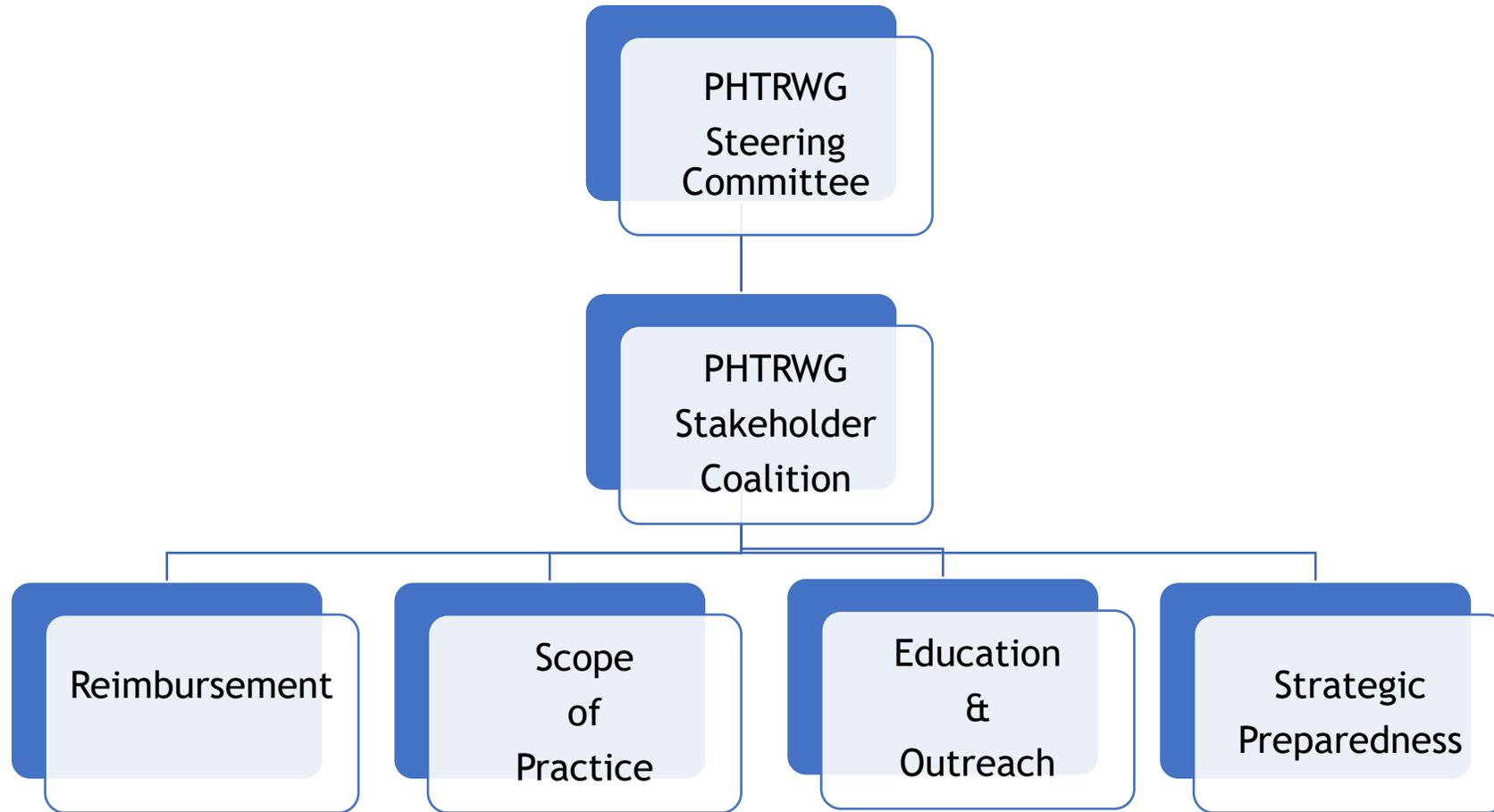
Loan from the suppliers

Operating costs of hospital or agency

Reimbursement options - who can bill?

- Federal and state insurers
  - Medicare / Medicaid
- Private insurers





**Collaborative  
Initiative**

**Players**

**Structure**

**Process**





WE WORK FOR

HEROES

Contact: [bskillman@veli.co](mailto:bskillman@veli.co)



PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION



**PREHOSPITAL  
BLOOD TRANSFUSION  
INITIATIVE COALITION**