



Pre-Hospital Blood Update

GCEMS BOARD MEETING

3/17/26

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Why is pre-hospital blood transfusion important?



Exsanguination is the leading cause of preventable death in trauma, with nearly half of these patients dying in the pre-hospital setting



For every 1 minute delay in pre-hospital resuscitation, there is a 2% increase in mortality



Pre-hospital blood transfusion decreases metabolic derangements, decreases total transfusion requirements and increases survival, shown in both military and civilian settings



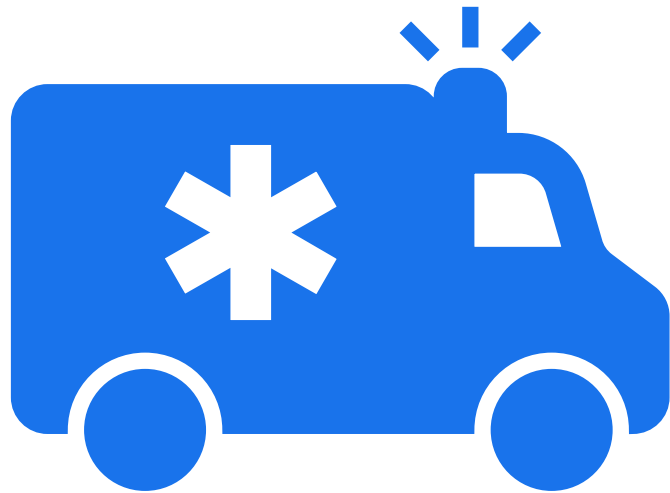
Only about 1-2% of ground EMS services in the US carry prehospital blood.

History

- Prehospital blood has been available in military combat settings since the 1950s
- Prehospital blood has been available for civilian air medical transport services since the 1990s
- Prehospital blood has been available for civilian ground EMS services since 2017 when the first dedicated programs began in Texas.
 - Utah – 1 ground service
 - DPS/EMS incorporated protocols for prehospital transfusion (paramedic level only) into state guidelines in 2025
 - Nevada – 1 ground service
 - Idaho – 1 ground service
 - Colorado – at least 6 ground services
 - Wyoming – 0 ground services
 - Arizona – 0 ground services



Society Position Statements



- American College of Surgeons (ACS), American College of Emergency Physicians (ACEP) and National Association of EMS Physicians (NAEMSP) Joint Position Statement 8/2022:
 - **Patients with signs of hemorrhagic shock should receive prehospital blood products whenever available.**
 - Establish a prehospital transfusion protocol utilizing a multidisciplinary collaborative approach
 - Whole blood is preferred over PRBC. If only component blood products are available, transfuse in a 1:1 ratio of plasma/PRBC
 - Ensure adequate supply and storage
 - Consider reallocation of older blood products to high-use areas to avoid expiry waste



Society Position Statements



- College Of American Pathologists (CAP) Position Statement 11/2025:
 - CAP is committed to supporting the EMS community and working with CMS and others to advance policies that will increase patient access to lifesaving prehospital blood transfusions.



GCEMS Timeline

- 2024
 - March: contacted Gunnison Valley EMS (CO). They are a similar agency which has had prehospital blood since 2019. Got their protocols and began researching needed equipment (coolers, etc.)
 - April: forwarded Gunnison information to the MRH lab/blood bank medical director. Reviewed all national guidelines
 - August: reviewed 33 months worth of GCEMS and MRH blood utilization data for use case. Assessed that GCEMS would average 1 prehospital transfusion/month and would deploy prehospital blood based on dispatch data at least 3X that. Shared this data with MRH lab medical director
 - October: West Valley Fire EMS began meeting with ARC and IHC to develop program
 - December: approached MRH administration to assess interest in a collaborative program – *received support to move forward*. Began working towards whole blood at MRH

GCEMS Timeline

- 2025
- March/April: reached out to Vitalent to assess feasibility and contract issues with MRH as a partner. *Vitalent does not contract directly with EMS agencies.* Researched similar hospital/EMS programs for the MRH lab medical director to address his concerns with limited success
- June: whole blood was obtained for use at MRH
- July: involved the MRH administration to help shepherd this project. Administration continued to voice support for this effort. Had an emergent deployment of whole blood to Classic which spurred this effort
- August: continued to research with Gunnison and Denver Health about rural EMS prehospital blood programs. Got the protocols from Intermountain that were used with West Vally Fire/EMS
- October: Had a site visit with GCEMS and MRH administration to Gunnison Valley hospital and EMS. West Valley Fire/EMS first deployment of blood on the ambulance.
- November: approached ARC. *Was informed that there was not a direct contracting option.* We provided an SBAR to MRH and started working toward Emergency Release process for EMS. Provided contacts for Denver Health and Gunnison to MRH.
- December: met with Denver Health blood center to discuss their rural prehospital blood programs. *They are not a partner option due to different state location*

GCESM Timeline

- 2026
- January: Emergency Release meeting with MRH team. Developed draft policy
- February: follow up to the Emergency Release meeting and prehospital blood program. *Was given a refusal to continue to work with us by the MRH lab medical director.* Reached out to ARC and South Texas Blood and Tissue – *both have options for direct contracting at this time.* We are pursuing. Approached IHC about a high-use hospital partnership – *that is not available at this time*
- March: will be providing ARC and South Texas with SOPs and discussing contract details/pricing





Key Process Points for Program Development

- Establish with a supplier of blood products and choose what types of products – in process
- Research and purchase necessary equipment – in process
- Develop GCEMS protocols for blood storage and transfusion – in process. We have samples from Gunnison Valley EMS, West Valley Fire, NOLA EMS and STRAC
- Conduct training regarding blood storage, transfusion, complications and documentation – initial training completed. Ongoing will be required
- Establish utilization and quality review protocols – in process
- Will require a GCEMS coordinator to oversee the program

Program Costs (upfront): Equipment

TIC SYSTEM

(THERMAL INSULATION CHAMBER)

- Blood Fridge at station (~\$3500)
- 2 x CREDO Coolers 4Liter (~\$875/each)
- Temperature monitoring (~\$250)
- Downside is significantly more handling and daily procedures, even when blood is not being administered.


DELTA APRU

(POWERED PORTABLE COOLER/FRIDGE)

- ~\$17,000
- Built in temperature monitoring and logging
- Battery backup
- Significantly reduced handling of blood products and simplified logistics.
- The major downside is cost.

Program Costs (ongoing): Product

- Blood products
 - **Whole blood:** approx. \$625/unit
 - 21 day shelf life: ARC guarantees "5 day fresh" so actually 16 day life
 - Approx. 23 units/year = \$14,325
 - 35 day shelf life: S. TX guarantees "next day fresh" so actually 34 day life
 - Approx 11 units/year = \$6,875
 - **PRBCs:** approx. \$300/unit
 - 21 day shelf life: ARC guarantees "5 day fresh" so actually 16 day life
 - Approx 23 units/year = \$6,900
 - S. TX does not currently have PRBC available
 - **Liquid plasma:** approx. \$100/unit
 - 21 day shelf life: ARC guarantees "5 day fresh" so actually 16 day life
 - Approx 23 units/year = \$2,300
- Whole blood is about \$6,900 – \$14,500 annually
- PRBC + plasma is about \$9200 annually
- PRBC alone is about \$6,900 annually



Program Costs (ongoing): Disposables & Training

- Fluid warmers - \$125/each disposable warming module
- Blood tubing - \$15/Y-tubing
- Training costs for EMS providers - variable



Ideal World

- Whole blood
- Storage and transport cooler in Captain's vehicle
- Agreement with a high-use hospital to pass along blood to avoid expiry waste
- We will come as close to this as possible based on access and cost limitations