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REPLY

Response to: "Evaluating the efficacy of prehospital transfusion: A critical analysis"

In reply:,

The focus of our systematic review was to summarize high evidentiary value trials of civilian prehospital transfusion (civPHT) on the key outcome of mortality to evaluate the potential benefit of civilian prehospital transfusion.[1] Our study represents the available trial evidence at the time of publication. The conclusions are based on that best available evidence, and while whole blood may be superior to individual components or combined component transfusion, there are insufficient data to support that conclusion.

The critiques of potential impact of time interval and total volume of transfusate are fair; however, these trials represent real world practice in those EMS systems and their associated outcomes. This is yet another area where there is a paucity of evidence to draw firm conclusions and is an opportunity for further study to better identify which patients would benefit from civPHT.

The works by Broome et al.[2] and Duchesne et al.[3] and were both published after our article and were not available during our systematic review. That being said, they both use the same data set and neither of these would have been included as they did not meet our inclusion criteria. These represent important exploratory work that should prompt additional investigation. However, as they are observational, no causation can be determined.

Fortunately, there are ongoing trials that we hope will address some of these important questions. SWiFT (Study of Whole Blood in Frontline Trauma) and SWiFT-Canada will compare component therapy and whole blood in helicopter EMS in the UK and Canada, respectively.[4,5] TOWAR (Type O Whole Blood and Assessment of Age During Prehospital Resuscitation Trial) is a randomized controlled trial that compares low-titer O+ whole blood to routine care (crystalloid as well as component therapy) with 30-day mortality as the primary endpoint.[6]

It is important to recognize that we only focused on one question and that is the potential mortality benefit of civPHT. We did not address the potential risks of widespread civPHT adoption such as impact on blood product availability or the risk of alloimmunization in females of childbearing potential. We routinely are notified about blood product shortages. Currently small programs are able to cycle their product back through their participating blood banks to minimize potential waste, but there may be a number of units in the field for which that no longer holds true.

A controversial area is the potential harm of alloimmunization and development of hemolytic disease of the fetus and newborn. While there have been a number of papers that extrapolate the risk, these are based on the risk of alloimmunization determined from fetal blood entering maternal circulation, not the intentional transfusion of comparatively large volumes of Rh-incompatible blood product. While the potential mortality benefit may outweigh the alloimmunization risk there is not enough data to draw any firm conclusions regarding the safety of transfusing Rh-incompatible blood products in females of childbearing potential.[7]

While there is a belief that "… whole blood is the best blood product for PHT," as evidenced by our systematic review, there are no trials to date to support this. While the available trial data do not specifically address civPHT of whole blood, the currently available trial data do not demonstrate a mortality benefit to civPHT. There are sufficient data to support ongoing research in the area of civPHT, but to date, there is not enough to support widespread expansion.

AUTHOR CONTRIBUTIONS

All authors substantially contributed to the drafting and revision.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

David W. Schoenfeld MD, MPH[1]
Carlo L. Rosen MD[1]
Tim Harris MBBS[2]
Stephen H. Thomas MD, MPH[1,2]

[1]*Department of Emergency Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, Massachusetts, USA*
[2]*Blizard Institute for Neuroscience, Surgery, and Trauma, Barts and The London School of Medicine, London, UK*

Correspondence
David W. Schoenfeld, EMS Division, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Boston, MA 02215, USA.
Email: dschoenf@bidmc.harvard.edu

ORCID

David W. Schoenfeld https://orcid.org/0009-0006-3909-3728
Stephen H. Thomas https://orcid.org/0000-0003-2833-5921

REFERENCES

1. Schoenfeld DW, Rosen CL, Harris T, Thomas SH. Assessing the one-month mortality impact of civilian-setting prehospital transfusion: a systematic review and meta-analysis. *Acad Emerg Med*. 2024;31:590-598.
2. 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.
3. 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*. 2024. https://doi.org/10.1097/ta.0000000000004363
4. Smith JE, Barnard EBG, Brown-O'Sullivan C, et al. The SWiFT trial (study of whole blood in frontline trauma)-the clinical and cost effectiveness of pre-hospital whole blood versus standard care in patients with life-threatening traumatic haemorrhage: study protocol for a multi-centre randomised controlled trial. *Trials*. 2023;24(1):725.
5. Study of Whole Blood in Frontline Trauma Canada (SWiFTCanada). ClinicalTrials.gov identifier: NCT06495294. Updated July 10, 2024. Accessed August 16, 2024. http://clinicaltrials.gov/study/NCT06495294
6. Sperry J, Type O. Whole blood and assessment of age during prehospital resuscitation trial (TOWAR). ClinicalTrials.gov identifier: NCT04684719. Updated March 25, 2024. Accessed August 16, 2024. http://clinicaltrials.gov/study/NCT04684719
7. O'Brien KL, Shainker SA, Callum J, et al. Primum, non nocere: whole blood, prehospital transfusion and anti-D hemolytic disease of the fetus and newborn. *Transfusion*. 2023;63(1):249-256.