

# International Prehospital Medicine Institute



## IPHMI Literature Review

Keeping You Up to Date with Current EMS Literature and Studies

### Vol. 8.7

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1. **Prehospital Whole Blood in Traumatic Hemorrhage – A Randomized Controlled Trial (SWiFT Trial)**  
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Prehospital blood transfusion for severely injured trauma patients has been an increasingly common practice worldwide. Traditionally, component therapy (packed red blood cells and/or plasma) has primarily been utilized, however whole blood transfusion is becoming more common. The use of whole blood has several advantages. It resembles exactly what the patient is losing in blood volume. It can be given as a single transfusion, instead of having to transfuse separate units of red blood cells (PRBC) and plasma. Since it is given as a single transfusion the risk of transfusion error is also decreased.

The Study of Whole Blood in Frontline Trauma (SWiFT) trial studied whether prehospital transfusion of up to 2 units of whole blood was superior to the traditional blood component (PRBC, plasma) in reducing death or massive transfusion requirements within 24 hours in patients with life-threatening hemorrhage from trauma. The SWiFT trial was a multicenter, unblinded, randomized, controlled, superiority trial of prehospital trauma patients with life-threatening bleeding. The study took place in England across 10 air ambulance services (comprised of physician and paramedic clinical teams) who transported to 19 hospitals. The authors compared outcomes in patients who were randomly assigned transfusion of up to 2 units of whole blood to those who received the traditional component therapy of PRBC and plasma. No other aspects of patient care during transport or after hospital arrival were altered. After hospital admission, additional blood components were administered according to their routine practice. Patients were excluded from the study if intravenous or intraosseous access could not be established, if they had a known objection to blood transfusion, or if they already received blood components prior to arrival of the helicopter. Patients already in cardiac arrest were also excluded.

The primary outcome studied was death from any cause or a massive transfusion requirement (defined as  $\geq 10$  units of any blood components within 24 hours). Secondary outcomes were death from

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any cause up to 90 days, days free from organ failure (up to 30 days), total number of units of blood components required, and the use of any additional hemostatic agents within 24 hours.

A total of 641 patients met criteria for enrollment in the study – 327 in the whole blood group and 314 in the standard care group. The participants were mostly male (75.5%) and blunt trauma (71.3%). The median injury severity score (ISS) was 33 (indicating most patients were classified as severely injured). Data on the primary outcome (24-hour survival or massive transfusion requirement) 48.7% for the whole blood group and 47.7% for the component therapy group (no statistically significant difference,  $p=0.84$ ). For the secondary outcomes, there were also no significant differences. While there were slightly more serious adverse events in the whole blood group compared to the component therapy group (37 vs 31 events) it was not statistically significant. Two transfusion-related events were noted in the component group and none in the whole blood group.

This study demonstrates that up to 2 units of prehospital whole blood therapy was not superior to the standard care of component therapy in reducing death or massive transfusion requirements at 24 hours. The secondary outcomes measured also showed no superiority of whole blood over standard component therapy. This study does have some limitations. The dose of 2 units of whole blood therapy may have been too little to show an effect. In a severely injured trauma patient, more blood is often required. The pragmatic design of the study, which relied on clinical judgement to initiate transfusion, may have led to the inclusion of some patients who did not have life-threatening hemorrhage. This study took place in a very mature trauma system with physician-paramedic aeromedical teams, so the results may not be translated to other EMS systems.

This is an interesting study which certainly leads one to question the role of whole blood versus component therapy in prehospital exsanguinating trauma. It is important to note that the study does not conclude that prehospital blood transfusion is not crucial to improving outcomes, merely that whole blood transfusion may not be superior to the traditional component therapy. Further studies are definitely warranted to see if these results are reproducible in other EMS systems, especially as whole blood therapy is increasing in popularity around the world.

### **2. Time To Tighten Up on Prehospital Tourniquets: An EAST Multicenter Trial of Prehospital Procedures in Penetrating Trauma Shows No Benefit with Current Tourniquet Practices for Extremity Trauma in Urban Settings.** Taghavi S, Simpson JT, Ali A, et al. *The American Surgeon* 2026;92:1169-1181

Following the success of tourniquet use in military operations, prehospital tourniquet application (PHT) in civilian trauma cases increased significantly. Civilian studies looking at survival and limb related complications have shown mixed results. In addition, some studies have noted tourniquet were placed in the absence of life-threatening hemorrhage and also torso injuries that are anatomically not amenable to benefit from application. Few studies have investigated whether PHT improves outcomes in the penetrating trauma in urban settings where definitive care is closer than in rural settings.

This study was a post hoc analysis of a multicenter study of adults with penetrating torso and/or proximal extremity trauma from 25 urban trauma centers. The patients were divided into two groups: Those that were treated with tourniquets and those that were not. They were further stratified based on the location of tourniquet application: prehospital or hospital.

They identified 2,352 adult patients with penetrating torso and/or proximal extremity injuries (wounds above the elbow or knee). Only 117 or 4% of these patients were treated with tourniquets. Most of them (73.5%) were applied on scene and 18% were applied en route. Twelve patients had tourniquets applied in the emergency department and another 11 patients required additional tourniquets to be applied.

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Analysis in their matched cohort showed no significant differences between the groups for any outcome examined. Both patients with and without tourniquets commonly went to the operating room (41.3% vs 35.2%,  $P=0.57$ ). There was no significant difference in mortality or other complications (7.3% vs 6.4%,  $P=0.32$ ) between the two groups. While patients from both groups that went to the operating room required packed red blood cell transfusions, more of the tourniquet patients received blood than the patients without tourniquets (35.8% vs 22%,  $P=0.05$ ).

The tourniquet group had a significant higher incidence of soft tissue injury than the non-tourniquet group (52.3% vs 32.1%) and there was no significant difference in the rate of true vascular injury (24.8% vs 23.9%). The femoral artery was the most frequently injured vessel but remarkably, 75.2% of the tourniquets were applied in the absence of vascular injury.

When taken as a sub-group, 95 patients sustained penetrating trauma with an associated vascular injury, of which 30 (32%) of these patients received tourniquets. Mortality was not significantly different in the tourniquet versus the non-tourniquet patients in this subgroup. There was one death in the tourniquet group and five deaths in the no tourniquet group. After matching, there was one death in each group.

Looking at isolated extremity injuries, they matched 75 patients in each group. The isolated extremity patients that received tourniquets were more likely to have vascular trauma than the patients that did not receive tourniquets (29.3% vs 8%). The tourniquet patients were more likely to go to the operating room and receive blood transfusions. There was no significant difference between the groups in mortality or other complications.

Limitations of this study include the overall small sample size which limits comparisons between groups. There was no information about prehospital times, choice of tourniquet, or any associated complications from the application of the tourniquet.

In this multi-center urban study, the use of tourniquets was not associated with decreased mortality or complications. They point out that identification in the prehospital setting of vascular injury and exsanguinating hemorrhage “remains elusive” as most of the tourniquets were applied in the absence of vascular injury. High quality, effective education efforts may increase appropriate and effective use of PHTs for patients who could truly benefit from tourniquet placement.

### **3. Emergency Medical Technician vs. Paramedic Placed Supraglottic Airways for Out-of-Hospital Cardiac Arrests** Huebinger R, Norii T, Braude D, Nassal MMJ, Fisher B, Wang HE. *Resuscitation* 2026 <https://doi.org/10.1016/j.resuscitation.2026.110998>

Definitive advanced airway control in out of hospital cardiac arrest (OHCA) has traditionally involved the placement of an endotracheal tube by a paramedic. Endotracheal intubation (ETI) is a challenging skill that paramedics must frequently practice to remain proficient. Often used as a backup airway when ETI is not successful, the less challenging to place and master supraglottic airway (SGA) is a viable first choice option employed by paramedics and by EMTs in many systems.

The authors of this paper conducted a University of New Mexico Health Sciences Center Institutional Review Board approved retrospective cohort study of data from the National EMS Information System (NEMSIS). NEMSIS is a national database of de-identified EMS patient data submitted by EMS agencies in all fifty of the states in the United States.

In addition to the basic demographics of adult patients who were treated for OHCA for the 5-year period between 1 January 2019 and 31 December 2023, the authors studied regional use of SGAs by EMTs with the primary outcome measures of return of spontaneous circulation rates and first pass success rates of SGAs by EMTs and paramedics.

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The authors identified and included 189,307 cases of OHCA when an SGA was used as a first attempt advanced airway. Paramedics placed 148,272 SGAs (78.4%) and 41,035 were placed by EMTs. The median patient age was 65; there were slightly more men than woman identified. White was the predominant race of patients and much more frequently patients were found and treated within private residences. There was not a significant difference in any group between EMT versus paramedic placed SGAs.

The study revealed that more SGAs were placed by EMTs in the North Central United States and the fewest in New England down through the Mid-Atlantic states. Over the time span of the study, there was a slight increase of EMT SGA use eastward from North Central America.

Both EMT's and paramedics had first pass success rates of SGA placement greater than 90%. Paramedic first pass success was slightly higher at 94.3% versus EMTs at 93.7%. ROSC rates between EMTs and paramedics were also very similar at 27.7% for EMTs and 26.8% for paramedics.

This study showed that there is an increase of SGA use by EMTs within the United States. First pass success rates for SGA placement by EMTs versus paramedics is equal between both groups as was the occurrence of ROSC.

There are multiple limitations of this short study. The first being the retrospective nature of the study using provider, self-reported data. Confirmation methods used by providers for first pass success were not included for accuracy of success rates. EMS crew configurations were not identified (EMT/EMT, EMT/paramedic). The increase in agencies reporting to NEMIS over the time span of the study may have affected the number of EMT SGA insertions reported over time and its increased use.

The ease and speed of SGA placement and skill retention over ETI may make these devices a viable option for all levels of EMS providers. Their use by EMTs on EMT/paramedic staffed EMS units may free up paramedic responsibilities for airway control, allowing the paramedic to focus on the overall resuscitation, cardiac monitor and medications critical to the treatment of OOHCA. EMS systems contemplating including EMT use of SGAs in their OHCA should also consider how successful placement of the SGA will be confirmed and documented by all levels of providers

#### **4. Resuscitative Efforts by Emergency Medical Services for Neonates Within the First Six Hours of Life: A Nationwide Cross-Sectional Analysis.** Peters GA, Swanton MF, Walsh LV, et al. *Pediatric Emergency Care* 2026;42:e47–e51

Pediatric resuscitation is a relatively rare occurrence for EMS providers as compared to adults. Neonatal resuscitation is even less common. With most births taking place within a hospital, this lowers the chances of resuscitation needed in the prehospital environment. While EMS providers receive training in pediatric and neonatal resuscitation, these high-acuity, low-frequency, high-stress situations demand that providers draw on all their skills and training to achieve the best possible outcomes for these patients.

The authors of this retrospective chart review utilized the National EMS Information System (NEMIS) data for the 2-year period from 2018 and 2019 with the purpose of examining the prehospital care for neonatal patients who required resuscitation or cardiac arrest within the United States. While the normal neonatal period is defined as 28 days after birth, the authors limited their data to those who received resuscitation within 6 hours of delivery. Initial data revealed 5749 neonatal patient contacts in the database; 4533 were eliminated due to the absence of resuscitation that did not meet the study criteria. An additional 633 were eliminated due to age discrimination. A total of 580 document cases were included in the study. For inclusion, these 580 cases had to include at least one of the following: chest compressions, airway management beyond normal oxygen and suction encountered during normal deliveries, Intravenous fluids, or medications. Interfacility transfers or non-emergent transfers were not included.

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Of the 580 newborns included in the study, 93% were attended by advanced life support units. OOHCA was reported in 184 patients, which resulted in the highest rate of invasive interventions. IV/IO access was performed in 12.4% of cases, oxygen was provided in 43.5% of patients, basic airway management (74.3%), and advanced airway intervention in 5.7%. The total prehospital time was just under 33 minutes with scene times of 15.3 minutes for neonates without OOHCA versus 10.9 minutes for those that did have OOHCA.

The authors stated that “We also found evidence that EMS clinicians prioritized minimization of scene and transport times for OHCA in newborn infants, likely at the expense of critical interventions.” While this study highlights key aspects of prehospital neonatal resuscitation, it does not address outcomes. Further studies linking neonatal resuscitation to hospital outcomes would be beneficial.