

# Utilization of Point-of-Care TEG During Massive Bleeds in Trauma Patients

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## Introduction

- Maintaining hemostasis in the presence of a massive bleed is one of the major challenges that clinicians encounter when treating trauma patients. The current recommendation is to transfuse at a 1 RBC:1 Plasma:1 Platelet ratio, then perform coagulation testing to monitor hemostasis (American College of Surgeons, 2014).
- The use of TEG-guided transfusions using the TEG 5000 in a trauma setting has been shown to result in fewer transfusions as well as improved patient outcomes when compared to the standard 1:1:1 transfusion ratio (Tapia et al., 2013; Unruh et al., 2019).
- The TEG 5000 is not considered a true point-of-care assay, resulting in the same limitations as traditional coagulation testing—staffing required to perform the testing and the amount of time required from specimen collection to specimen result.
- As a result, the TEG 6s was developed to be a moderately complex assay that can be performed at the patient bedside.
- Parallel testing between the TEG 6s and the TEG 5000 has shown adequate correlation and precision (Gurbel et al., 2016).
- It is necessary to assess whether the TEG 6s should be implemented in trauma centers to guide transfusions in patients with massive bleeds.

## Objectives

- To determine whether utilizing TEG 6s-guided transfusions in a trauma setting results in better patient outcomes when compared to the standard 1:1:1 transfusion ratio.

## Methods

- Data was collected in trauma patients with massive bleeds in a Level 1 Trauma Center for two years.
  - 126 patients in the first year were transfused with sets of blood in a pre-determined ratio of RBC:FFP:Platelets and hemostasis was monitored as needed with traditional coagulation testing.
  - 175 patients in the second year received one set of blood at the set ratio, with subsequent transfusions guided by TEG 6s results.

Assay	Value	Transfuse
RapidTEG	MA < 50 mm	3 Cryo
	MA ≥ 50 mm	2 Cryo
	ACT ≥ 120 sec	Plasma
	LY30 ≥ 3%	Tranexamic Acid
TEG Functional Fibrinogen	MA < 14 mm	Cryo (See RapidTEG MA)
	MA ≥ 14 mm	1 Pool Platelet

Figure 1. Transfusion volumes determined by TEG 6s results. There is currently no standard transfusion algorithm for the TEG 6s, so volumes were determined by previous studies. Data taken from Cochrane et al., 2020.

- Mortality was monitored at 24 hours and 30 days post-admission.
- Product usage was analyzed for both groups.
- Costs were calculated based on the cost of patient testing and product usage and waste.

## Results

- Patients that received TEG 6s-guided transfusions had decreased mortality rates.

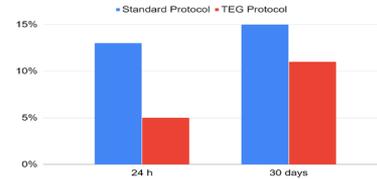


Figure 2. Mortality at 24 hours and 30 days of patients receiving the standard transfusion protocol compared to TEG 6s-guided transfusions. Patients receiving the TEG protocol had decreased mortality after both 24 hours and 30 days. Data taken from Cochrane et al., 2020.

- There was no significant difference in product usage between groups.
- Fewer blood products were wasted in the group treated using TEG 6s.

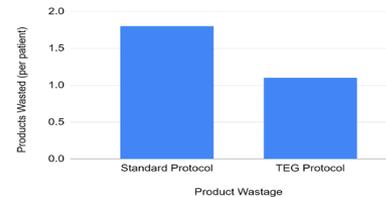


Figure 3. Average number of products wasted per patient. Fewer products were wasted when utilizing the TEG 6s to guide transfusions. Data taken from Cochrane et al., 2020.

- No significant difference in cost was identified between the two groups.

## Discussion

- Patients had better outcomes when transfusions were guided by TEG 6s results.
- There does not appear to be an increased cost associated with the TEG 6s when compared to massive transfusions with traditional coagulation monitoring.
- A significant decrease in turnaround time was identified when using the TEG 6s.
- More studies are needed to evaluate the transfusion cutoff values specific to the TEG 6s.
- Studies are needed to compare patient outcomes when utilizing the TEG 5000 compared to the TEG 6s.

## References

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