

Clinical Pearls from the Preventable Mortality Review Committee



Advantages of Plasma Over Crystalloid, Albumin, and Red Blood Cells (RBCs)

- **Volume Restoration:** Plasma resuscitation restores intravascular volume more effectively than crystalloids or albumin.
- **Coagulation:** Plasma has clotting factors that slow bleeding, making it a superior option for trauma resuscitation.
- **Endothelium:** Plasma helps repair endothelial injury and maintains microvascular integrity, which is crucial in trauma care.

Importance of Liquid or Thawed Plasma for Early Intervention

- **Immediate Availability:** Liquid or thawed plasma is ready for use more quickly than frozen plasma (FFP), which requires time to thaw.
- **Longer Shelf Life:** Liquid plasma has a 26-day shelf life with common anticoagulants (extendable to 40 days with less common ones), allowing for better inventory management and reduced waste.
- **Clinical Efficacy:** Thawed plasma retains clinically significant levels of essential clotting factors over 5 days, making it a viable option for immediate use.

Practical Considerations and Logistical Benefits

- **Thaw Times and Shelf Life:** FFP takes 30-45 minutes to thaw. Thawed plasma retains activity over 5 days, while liquid plasma offers a longer shelf life and is immediately available for transfusion.
- **Emergency Preparedness:** Stocking thawed plasma in emergency departments reduces the time to first transfusion and overall mortality.
- **Improved Inventory Management:** The extended shelf life of liquid (never frozen) plasma reduces waste and ensures better preparedness for trauma care.

1. Sperry JL, et al. Prehospital plasma during air medical transport in trauma patients at risk for hemorrhagic shock. *New England Journal of Medicine*. 2018 Jul 26;379(4):315-26.

2. Holcomb JB, et al. Transfusion of plasma, platelets, and red blood cells in a 1:1:1 vs a 1:1:2 ratio and mortality in patients with severe trauma: the PROPPR randomized clinical trial. *Jama*. 2015 Feb 3;313(5):471-82.

Clinical and Logistical Optimization

- **Optimized Trauma Care:** Early high-ratio plasma use in trauma patients improves survival rates.¹⁻²
- **Reduced Wastage:** Introducing liquid plasma can reduce wastage and associated costs while improving clinical outcomes in severely injured patients.

Cost-Effectiveness of Plasma

- **Cost Comparison:**
 - 1 unit of RBC \approx 4-5 units of plasma.
 - 1 dose of cryoprecipitate \approx 10 units of plasma.
 - 1 apheresis unit of platelets $>$ 10 units of plasma.
 - 5% albumin costs 2-3 times more than a similar volume of plasma.
 - Factor concentrates can cost thousands of dollars.
- **Affordability:** Plasma units typically cost around \$50-60, with potential slight increases in low-usage hospitals. This cost is justified by the significant impact on patient outcomes and overall hospital cost savings.
- **Reduction in Waste:** Implementing liquid plasma has been shown to significantly reduce plasma wastage and healthcare costs by ensuring that plasma is used before it expires.

Plasma in Treating Other Conditions

- **Sepsis:** Plasma can be used to manage coagulopathy and restore intravascular volume in septic patients.
- **Burns:** Plasma effectively treats burn patients by maintaining microvascular integrity and helping repair endothelial injury.

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These guidelines were prepared by the ADH (trauma medical consultant) and members of the Arkansas State Preventable Mortality Committee. They are intended to serve as guidelines based on a review of the current medical literature. They are not intended to be used as strict policies or protocols. Their use is at the discretion of the managing physician.



Arkansas Trauma System