Hemorrhage-related hypovolemia after trauma can be divided into three phases:

- **Phase I** is the period from injury to operation for control of bleeding (pre-definite care),
- **Phase II** is the period immediately during and after surgery,
- **Phase III** is the period of the trauma patient in the ICU (post definite care).
Pre-Hospital Ideal Resuscitation Fluid

- Maintains Circulating Blood Volume
- Maintains or Augments Coagulation Factors
- Has Oxygen Carrying Capacity
- Long Shelf Life
- No Infectious or Toxic Side Effects
- Readily Available at Low Cost
Spectrum of Options

- Closest is Patient’s Own Whole Blood
- PRBC
- Fresh Plasma
- Crystalloids
- Hetastarch
- Plasma Expander
- Tranexamic Acid (TXA)
- Permissive Hypotension (Reserved)
Freeze Dried Plasma

Swine Modeling FFP vs Lyophilized Freeze Dried Plasma

- Plasma can be lyophilized and freeze-dried to create a logistically superior product without compromising its hemostatic properties. This product may be suitable for use in austere environments, such as a battlefield, for the treatment of trauma-associated coagulopathy.

This special report describes the broader implications of prehospital fluid resuscitation in the context of what is the first reported case of point-of-injury use of reconstituted, lyophilized single-donor freeze dried plasma (FDP) as a resuscitative fluid. The Israeli Defense Force Medical Corp (IDF-MC) has deployed FDP as another step in the evolution of casualty care to bring damage-control resuscitation closer to the point of injury as part of multidisciplinary effort to improve trauma victims outcome.

Point-of-injury use of reconstituted freeze dried plasma as a resuscitative fluid: A special report for prehospital trauma care

Glassberg, Elon MD Journal of Trauma and Acute Care Surgery: August 2013 Vol 75 Issue 2 pS111-S114
Explosives are the weapon of choice for most terrorists, and terrorist bombings averaged two per day worldwide in 2005.

- Blast Injury – CDC
- Blast Lung - CDC
Essential to Align Databases

- FDA Class II or III Intervention of Medication
- NEMSIS is the nation’s EMS database which is in the process of being upgraded to Health Level 7 (HL7) Interface, ICD 10-CM and SnoMed CT definitions
- NTDB focused on Injury Severity Scores, ICD 10-CM and surgical interventions
Current Practices

• Airway Management
  – Indications
  – Device
  – Successful measures
  – Complications Documented
  – EMS and Institutional Review
  – FDA review?
Safety and Effectiveness

- Integration of datasets to facilitate reviews at all levels
- Should be a continuous process from injury to recovery
- Select Priority Interventions and Medications
- Research of novel interventions
Encourage Research & Development

- Ideal Resuscitation Fluid Discovery
- Support Products That Come Close
- Targeted Grants (Similar to Biotechnical)
- Alignment of pre-approval and post market on going evolutions with EMS and trauma registry systems