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TRAUMATIC HEMORRHAGE AND MASSIVE TRANSFUSION PROTOCOLS

Christie L Fritz

EMS Division, Emergency Medicine, Beth Israel; Deaconess Medical Center; Harvard Medical School; BIDMC Ambulance Service, USA

Hemorrhage remains the leading preventable cause of death in trauma, and massive transfusion protocols (MTPs) have become standard of care, now almost ubiquitous in major trauma centers. This lecture reviews the history of transfusion medicine and the pathophysiology of trauma-induced coagulopathy, including the lethal triad and acute coagulopathy of trauma-shock. It examines the evidence that structured MTPs and protocol compliance improve outcomes, along with strategies for identifying patients who need activation, including clinical gestalt, shock index, and scoring systems such as the ABC score. The talk then reviews the landmark studies, which support balanced resuscitation strategies. It also covers transfusion best practices, common MTP challenges and approaches to guiding ongoing resuscitation using vital signs, laboratory targets, and viscoelastic testing, including the neutral ITACTIC trial.

The presentation closes with emerging and evolving practices, along with recent evidence updates through 2026. Topics include cell salvage, liquid plasma, prehospital blood products, and the importance of early calcium repletion, TXA, and cryoprecipitate. Observational data had suggested a mortality benefit for whole blood, but two large 2026 randomized trials (TOWAR and SWiFT) found no significant difference compared with component therapy, and a 2025 Cochrane review found no clear RCT-level consensus on optimal transfusion strategy. Whole blood therefore remains logistically attractive, particularly in EMS and austere settings, but should no longer be presented as a proven mortality-reduction strategy. Key take-home points are to maintain balanced resuscitation, invest in program development and quality assurance, give calcium and TXA early, and recognize that evidence on ongoing MTP guidance continues to evolve.

Keywords: Massive Transfusion Protocol (MTP), Trauma-Induced Coagulopathy (TIC), Hemorrhagic Shock, Balanced Resuscitation