

# Whole lot of blood: does more equal better for survival?

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The landmark trial conducted by Holcomb *et al* evaluating the effectiveness of a high ratio balanced transfusion of blood components has undoubtedly propelled trauma care forward.<sup>1</sup> Despite such strides, traumatic bleeding persists as the primary cause of preventable deaths in the USA.<sup>2</sup> However, suppose one were to simply think about the concept learned from the randomized control trial by Holcomb *et al* and what has since become the standard approach for trauma resuscitation. In that case, we are breaking down whole blood into its components only to transfuse them separately, all in an attempt to recreate the original blend of whole blood. It stands to reason that transfusing whole blood may offer comparable or even superior advantages compared with administering separated components for exsanguinating trauma patients.

Whole blood as an emergency release transfusion for severely bleeding trauma patients has rapidly gained traction in civilian trauma centers throughout the USA.<sup>3</sup> Prior studies evaluating the impact of whole blood in civilian trauma have demonstrated an associated survival advantage over using component therapy alone.<sup>4,5</sup> However, these studies have yet to delve into how whole blood transfusions are used for trauma patients with severe bleeding.

To address this gap, Lammers *et al* conducted a single-institution retrospective study of 390 patients, comparing the ratio of whole blood to packed red blood cells (RBCs) on early mortality in civilian adult trauma patients presenting with hemorrhagic shock.<sup>6</sup> Staying consistent with the idea of a balanced transfusion approach, the authors aimed to understand how different “doses” of whole blood impact patient outcomes by analyzing the ratio of whole blood transfusions to RBC administrations. They found that a ratio of whole blood to RBC  $\geq 1$  was associated with improved 4-hour and 24-hour survival and significantly reducing overall transfusion needs.

Whole blood transfusion offers a swift and efficient means of providing a high-ratio blood transfusion with a superior hemostatic profile. With this in mind, it is reasonable to anticipate that administering more whole blood would lead to enhanced chances of survival, consistent with the results of this study.

Although we appreciate the work of Lammers and colleagues, it is crucial to acknowledge the limitations of this single-institution retrospective study, which may be susceptible to bias and residual confounding. What is urgently needed are prospective randomized trials that can confidently demonstrate the effectiveness of whole-blood resuscitation and analyze the most optimal strategy for its use. Currently, a large multicenter trial is underway, focusing on in-hospital whole-blood resuscitation for trauma patients with severe

hemorrhage.<sup>7</sup> With randomized trials complementing the existing research, we anticipate a transformative shift toward whole-blood resuscitation as the cornerstone of treatment for critically injured patients experiencing severe hemorrhage.

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