Holcomb, J. et al. (2013) The Prospective, Observational, Multicenter, Major Trauma Transfusion (PROMMTT) Study: Comparative Effectiveness of a Time-Varying Treatment With Competing Risks. JAMA Surgery. 148 (2). 127-136.

Is the Study Valid?	
Was the sample of patient's representative?	The inclusion and exclusion criteria selected patients who were victims of trauma of any type and who were in the initial stages of their resuscitation. "required the highest level of trauma activation, were aged 16 years or older, and received a transfusion of at least 1 unit of RBCs in the first 6 hours after admission. Patients were excluded if they met the following criteria: (1) were transferred from other facilities; (2) were declared dead within 30 minutes of admission; (3) had received more than 5 minutes of cardiopulmonary resuscitation prior to or within 30 minutes of admission; (4) were prisoners; (5) had a burn injury of more than 20% of the total body surface area; (6) had inhalation injury as diagnosed by bronchoscopy; or (7) were pregnant." To counter survival bias, to be included in the analysis, a patient had to survive the first 30 min of admission and long enough to receive 3 units of product
Were patients sufficiently homogeneous with respect to prognostic risk?	It is not clear whether or not the groups were homogeneous with regards to prognostic factors. There are 3 primary groups that are analyzed: low (<1:2), moderate (>1:2 to <1:1), and high (>1:1). There is no information provided by the authors as to the make up of these individual groups, their demographics, their starting ISS, mechanisms of injury, etc. As seen in Figure 1, it is likely that there is significant heterogeneity in terms of how the patients received the blood transfusion. There were significant differences in the timing and delivery of blood products to all patients. A fixed ratio transfusion strategy was not universally employed.
Were objective and unbiased outcome criteria used?	Yes, primary outcome was in-hospital mortality. "Cause of in-hospital death was determined by the individual site clinicians without confirmation or central adjudication."
Was the follow-up sufficiently complete?	Yes. 100% of patients in the analysis cohort and in the "all enrolled patients" cohort were followed to completion of the primary end point and out to 30 days.

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What are the Results?	
How strong and how precise was the association between exposure and outcome?	**Plasma:RBC** • 0-6 hr: HR for mortality for Moderate and High ratio plasma:RBC were 0.42 and 0.23 respectively (no CI described). • 6-24 hr: HR for mortality for Moderate and High ratio plasma:RBC were 0.79 (ns) and 0.55 (ns) respectively • >24hr-30 day: HR for mortality for Moderate and High ratio plasma:RBC were 1.41 (ns) and 1.47 (ns) respectively **Platelet:RBC** • 0-6 hr: HR for mortality for Moderate and High ratio platelet:RBC were 0.66 (ns) and 0.37 (p =0.04) • 6-24 hr: HR for mortality for Moderate and High ratio platelet:RBC were 0.79 (ns) and 0.49 (ns) • >24 hr-30 day: HR for mortality for Moderate and High ratio platelet:RBC were 1.23 (ns) and 0.69 (ns) There is a signal of mortality benefit in the early hours of resuscitation with the transfusion of higher volumes of plasma and potentially platelets. None of these mortality benefits, however, extend out beyond the initial 6 hours of resuscitation.
How Do I Apply the Results to My Patient?	
Were the study patients and their management similar to my setting?	The analyzed cohort appears similar to patients treated in the SRU of UCMC. The mechanisms of injury, ISS, site of hemorrhage all appear generally similar to our own patients. The transfusion strategies employed in these patients is likely different than the approach to transfusion often employed in our own patient population. Especially in transfusion, we are more likely to employ a fixed ratio transfusion strategy that includes the early administration of thawed plasma.
Was follow up sufficiently long?	Yes. A 30 day follow should have been adequate to address the meaningful impact and any potential adverse effects from the administration of higher volumes of plasma and platelets.

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How Do I Apply the Results to My Patient?	
Can I use the results in managing patients in my practice?	There are several possible interpretations of this article. With the caveat that this particular study is limited by significant heterogeneity in the administration of blood products and by the observational nature of the trial, this article shows that there is potentially a benefit to early mortality if higher volumes of plasma are administered. This potential benefit is more convincing because of the exclusion of patients that died within 30 min of arrival (which would have otherwise greatly increased the mortality in the low ratio groups). Thus, one interpretation is that there is benefit for the aggressive administration of plasma and potentially platelets in the early resuscitation of bleeding trauma patients. An alternative interpretation is as follows. The additional systemic costs of providing plasma and platelets in the a timely fashion outweighs the any mortality benefits especially since there is no evidence of lasting mortality benefit beyond 6 hours. And, in fact, there may be a trend to higher mortality at 30 days with the administration of higher volumes of plasma and platelets.