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Reference:
Kasotakis, G et al; Aggressive early crystalloid resuscitation adversely affects outcomes in adult blunt trauma patients: An analysis of the Glue Grant database; Journal of Trauma, volume 74, Number 5

Clinical question:
Does aggressive early crystalloid resuscitation in the first 24 hours increase mortality or morbidity in blunt trauma patients?

Introduction:
Aggressive resuscitation strategies have been the cornerstone of early trauma management for decades. Recent evidence is beginning to challenge this long held belief by showing aggressive crystalloid resuscitation can worsen acidosis and disrupt endothelium by overload vasculature leading to inflammatory response. This paper evaluated blunt trauma for possible risks in aggressive resuscitation.

Methods:
Data was extracted from the Glue Grant database, which was prospectively collected multicenter cohort of severely injured blunt trauma patients in hemorrhagic shock. Level of resuscitation was broken down into groups receiving <5L, 5-10L, 10-15L, and >15L and evaluated for morbidity.

Participants:
Blunt trauma pts age 16-90, without spinal cord injury, isolated brain trauma, or thermal burns >20%. Excluded if pt expired within 48 hours or was discharged within 72 hours.

Results
2002 eligible pts, 1754 enrolled. Pts were fairly young (avg age 43.5) and otherwise healthy with Charlson Comorbidity scale of 0-1. Amount of crystalloid administered over the first 24 hr was not a predictor of all cause mortality. Increasing crystalloid resuscitation did however significantly increase morbidity. It conferred a prolonged time on the ventilator, time in the ICU and overall hospital LOS. To help with analysis baseline age, admission GCS score, injury and acute physiology severity, pre-existing comorbidities, trauma burden, and colloid/blood transfusion were controlled. There was a dose-dependent increase in severe complications such as ALI/ARDS, multi organ failure, abdominal compartment syndromes and surgical site infections. Odds ratio of developing of ALI/ARDS and MOF was 3 times higher in the group receiving >15 L of crystalloid over the first 24 hours.

Discussion
This study showed significant increase in morbidity with high volume crystalloid resuscitation despite no difference in mortality. As with most studies, there is still a need for more definitive well-designed randomized studies but the data seen in this study is concerning enough to refrain from using high volume crystalloid in initial resuscitation of blunt trauma when able.