Introduction:
Massive Transfusion Protocols (MTP) are a routine component of any major trauma center’s armamentarium in the management of exsanguinating hemorrhages. Little is known about the potential complications of those that survive an MTP. We sought to determine the incidence of venous thromboembolism (VTE) following MTP. We hypothesized that MTP would be associated with a higher risk of VTE in a risk-adjusted control population without MTP.

Methods:
The Pennsylvania Trauma Outcome Study database was retrospectively queried from 2009-2017 for trauma patients who developed VTE while at an accredited trauma center in Pennsylvania. Patient demographics, injury severity and clinical outcomes were compared to assess differences in VTE development between MT and non-MTP patients. A multivariate logistic regression model assessed the adjusted impact of MTP on VTE development. Wilcoxon rank-sum test was used to assess differences in age, injury severity scale (ISS) and Glasgow coma scale (GCS).

Results:
368,838 patients met inclusion criteria. Of those, 4,835 developed a VTE [pulmonary embolism (PE): 1,272; deep vein thrombosis (DVT): 3,221; PE and DVT: 342.] Of the 1,479 who received MTP, 116 developed a VTE during their admission. In adjusted analysis, patients who had an MTP and survived more than 24 hours had a higher odds of developing a VTE (AOR: 4.56; 95% CI: 3.61-5.74; p <0.001; AUROC: 0.783).

Conclusion:
MTP is a harbinger for a higher risk of VTE in those patients who survive. This may be related to overcorrection of coagulation deficits encountered in the hemorrhagic event. A high index of suspicion for the development of VTE as well as aggressive VTE prophylaxis is warranted in those patients who survive MTP.