Objective(s): Frailty is a predictor of poor outcomes after vascular surgery. Our objectives were to determine the predictive utility of frailty severity after first-time revascularization and to identify biomarkers of frailty in patients with peripheral arterial disease. Hypotheses: (1) Frailty predicts adverse outcomes after open revascularization (OV) but not after endovascular revascularization (EV); and (2) select preoperative data may serve as biomarkers of frailty.

Methods: A retrospective cohort study was performed of all first-time revascularizations (OV and EV; hybrid excluded) in male veterans at a single institution (2003-2016). Multivariable logistic and Cox proportional hazard regression models were used to examine the relationship between the modified frailty index (mFI) and post-operative short-term (30-day complications and readmission) and long-term (up to 2-year incidence of re-intervention, amputation, or mortality) outcomes, respectively while accounting for differences in patient treatment assignment, demographics and preoperative lab values.

Results: 431 patients (OV n=188; EV n=243), with a mean age of 66±9 years and median follow up of 16 months were included. Treatment groups were similar in baseline characteristics, lab values, and polypharmacy tallies. Mean mFI was 0.38±0.16 for the OV group and 0.38±0.15 for the EV group (p=0.43). The odds of 30-day complications increased in the OV group with increasing frailty severity (adjusted OR 5.34; 95%CI: 1.58-18.06), but not in the EV group. The odds of 30-day readmission increased in both treatment groups with increasing mFI (aOR 5.58; 95%CI: 1.13-5.86). Kaplan Meier analysis showed increased risk of amputation, death, and the composite outcome of amputation and/or death in both treatment groups when stratified into low, moderate and high mFI groups (p<0.05 for all). However, the adjusted HR was not significant for any of the long-term outcomes. Increasing albumin concentration significantly correlated with increased mFI in the EV group (p<0.01), and showed a trend with increased mFI in the OV group. Independent of treatment assignment and preoperative mFI, higher albumin concentration was associated with lower risk of amputation (aHR: 0.58; 95% CI: 0.36-0.94) and mortality (aHR: 0.45; 95% CI: 0.25-0.83).

Conclusions: Hypoalbuminemia is associated with higher mFI and independently predicted adverse outcome after first-time lower extremity revascularization. While the mFI is predictive of short-term outcomes in this population, the prognostic utility of the mFI on long term-outcomes warrants further investigation.