Introduction: Total joint arthroplasty (TJA) volume has been projected to be increasing with total hip arthroplasty increasing from 43% to 70% from 2014 to 2030 and total knee arthroplasty volume increasing 153% from 2012 to 2050. Arthroplasty remain a common procedure in volume with proven excellent outcomes due to generational advances in implant survivorship, post operative course complications present a monetary and logistical challenge to the stakeholders of the healthcare system. As such, pre-operative optimization of comorbidities, situational variables and patient demographics provide guidance on intervention aimed to address quality of care. Frailty has been associated with higher risk for complications in the post operative setting and negative impact of hospital economic outcomes. However, although there are reported impact of obesity and frailty asindependent peri-operative factors, there is scarcity in literature regarding the delineation between obesity and frailty in post operative outcomes following total hip and knee arthroplasty. Further depth in these factors allow for better optimization protocols andappropriate resource distribution.

Methods: Retrospective analysis was done utilizing discharge data from 2006 to the third quarter of 2015 from the National Inpatient Sample (NIS). This database accounts for approximately 20-25% of inpatient stays across the continental United States and provides information includingpatient demographics, comorbidity profiles, and inpatient outcomes. The International Classification of Disease, Ninth Revision, Clinical Modification (ICD-9-CM) was used to identifyprocedure and diagnosis codes within the NIS database. The study excluded data from the last quarter of 2015 due to the transition of ICD-9 to ICD-10. The authors seek to maintain homogeneity with the established study protocol.The patients were then stratified to one of three groups: 1) patients with frailty as defined bythe Frailty Indicator without a concomitant diagnosis of obesity, 2) obese patients without a concomitant diagnosis of frailty, and 3) obese patients with concomitant diagnosis of frailty. Demographic variables collected include age, gender, ethnicity, hospital location, payer status,US region.

Results: Direct head-to-head comparison between frailty and obesity demonstrated significant differences in demographics. Average age of frailty was 63 compared to obesity of 61. There were significant differences in resource utilization between frail and obesity in length of stay (3.2 vs 3.5) and total charges ($52,465.1 vs $69,821.3). Among comorbidity analysis there was a significant difference lymphoma (0.22% vs 0.55%), fluid and electrolyte disorder (9.32% vs 7.11%), and neurological disease (0.07% vs 0.01%). There were significant differences in postoperative complications with their associated odds ratio among CNS 5.94 (1.51-23.4), cardiac 2.9 (1.47-5.76), GI 3.58 (1.08-11.9), GU 5.42 (2.49-11.8), and infection 6.25 (1.81-21.5).

Discussion: Total Joint Arthroplasties include total hip and knee arthroplasty are among the most common procedures performed in the United States. There is a projected increase in demand for total joint arthroplasty. Total hip arthroplasty is expected to rise from 300,000 in 2019 to 850,000 in2030 and 1.4 million in 2040. Respectively, total knee arthroplasty is projected to increase by 1.9 million in 2030 and 3.4 million in 2040. In lieu of total joint arthroplasty excellent outcomes, there exist a shift in the United States reimbursement model. Since 2016, the Comprehensive Care for Joint Replacement (CJR) was introduced to shift towards value and quality care. This model has since been scrutinized with patient access as providers are incentivized to limit higher-risk patients. There has since been increasing traction to stratify risk in efforts to guide optimization protocols. While patient-specific factors are closely tied tooutcomes, there lack attention towards frailty, syndromic combination of age-related loss of physiological reserve and increased susceptibility to adverse outcomes. This study, the authors assessed the impact of frailty and obesity through resource utilization, comorbidity differences, and postoperative complications. We found that frailty as a syndromiccondition have worsened postoperative outcomes.

Significance/Clinical Relevance: Despite the limitations of a large cross-sectional database, this study presents the comparison between frailty and obesity among patients receiving total joint arthroplasty The volume and duration period provide analysis for demographics, comorbidity, economical utilization andpostoperative outcomes following either a total hip or knee arthroplasty. The vast data analyzed by this study seek to provide additional data for future studies to advance the knowledge of frailty as another variable of interest. This study aims to provide insight and to guide future protocols to optimize total joint arthroplasty recipients in this evolving value-based setting of care.