Introduction:
The treatment of TKA patients on an outpatient basis or with shortened stays appears to be gaining some popularity over recent years. Previous studies have shown the benefit in terms of cost savings for outpatient procedures and shortened stays, but results pertaining to the associated complication and mortality risks are still uncertain. Although some studies have compared short term outcomes of patients with differing lengths of stay, none have done so beyond a small geographically specific sample size. The purpose of the present study is to determine the differences in cost, complications, and mortality between Medicare patients who stay the standard 3-4 nights in a hospital versus those who are treated either for an outpatient procedure or a shortened stay.

Methods:
The Medicare 5% LDS sample was used to identify patients with a total knee arthroplasty procedure between 1997-2009 using ICD-9-CM (81.53) and CPT4 (27447) codes. TKA patients were separated into the groups treated in the following hospital settings: outpatient, 1 day inpatient, 2 days inpatient, 3-4 day inpatient ("standard stay"), or 5+ days inpatient. Results considered average annual payments adjusted to Jan-2011$, mortality, readmission, revision, and common complications (Table 1). Differences in costs and risk ratios for each outcome were adjusted using logistic regression for age, sex, race, buy-in status, region, and Charlson score. The "standard stay" patients were compared to the other groups at 90 days, 1 year, and 2 years after surgery.

Results:
There were 73,498 3-4 day "standard stay" patients, 23,534 5+ day, 6,756 2 day, 1,374 1 day, and 2,883 outpatient patients in the study cohort. Compared to the 3-4 day standard stay group, the incremental payments for osteoarthritis attributable costs at 2 years were -$6,964 (outpatient), -$3,327 (1 Day), -$1,681 (2 Day), and +$1,159 (5+ Day). At 1 year, the outpatient group had less pain (Hazard Ratio (HR)=0.86, p=0.0001) and stiffness (HR=0.82, p=0.0167) in comparison to the traditional stay group, but had higher 90-day infection (HR=1.44, p=0.0397), dislocation (HR=1.77, p=0.0468) readmission (HR=1.57, p=0.042), and mortality (HR=2.13, p=0.0005) risks (Table 1). The 1 day group had less pain (HR=0.83, p=0.0022), but a higher risk of mortality (HR=1.62, p=0.0198) and revision (HR=1.93, p=0.0018) at 1 year. The 2 day group had a higher risk for dislocation (HR=1.37, p=0.0436), implant loosening (HR=1.92, p=0.005), mortality (HR=1.26, p=0.0385), and revision (HR=1.51, p=0.0231) at 1 year.

Discussion and Conclusion:
We estimated the costs, mortality and complications after TKA for differing lengths of stay in the US Medicare population. Compared to "standard stay" patients, there were sizeable cost reductions but an increased revision and mortality risk for the outpatient and short stay TKA groups. The shorter stay groups did show an improvement in associated pain and stiffness compared to standard stay patients. The 5+ stay group suffered the highest costs and adjusted risks for mortality, revision, and many of the complications analyzed. Previous site specific studies have shown reductions in costs and complications when shortened lengths of stay are part of a clinical pathway program. Our study suggests that shortening the length of stay after TKA results in improved short term outcome (pain and stiffness) but an increased complication and mortality risk to the patient.

Significance:
Previous studies have shown the benefit in terms of cost savings for shortened stays, but results pertaining to the complication and mortality risk are still uncertain. Cost, mortality and disease outcomes were compared for a large cohort of patients undergoing TKA for osteoarthritis but with different lengths of hospital stay, including those who underwent TKA on an outpatient basis. Despite sizeable cost reductions, there was an increased revision and mortality risk for the outpatient and short stay TKA groups relative to the standard stay group.