Opioid Use Following Total Knee Arthroplasty – Trends and Risk Factors for Prolonged Use
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INTRODUCTION:
The United States is in the midst of an opioid epidemic. However, little is known about perioperative opioid use for total knee arthroplasty (TKA) patients. Thus, the purpose of this study was to identify rates of preoperative opioid use, evaluate postoperative trends in opioid use, and identify risk factors for prolonged use following TKA.

METHODS:
The Humana Inc. database was reviewed from 2007-2014 and primary TKA patients were identified. Postoperative opioid use was measured by monthly prescription refill rates. Intrinsic patient factors analyzed for impact on post-op opioid use included: preoperative opioid use, anxiety/depression, low back pain, myalgia, drug dependence, alcohol dependence, smoking status, sex and age. A preoperative opioid user (OU) was defined by history of opioid prescription within three months prior to TKA and a non-opioid user (NOU) was defined by no history of prior opioid use. Rates of opioid use were trended monthly for one year postoperatively for all cohorts and compared using standard statistical techniques.

RESULTS:
In total, 73,959 TKA patients were analyzed. Of these, 23,532 patients (31.2%) were OU. There was an increase in the number of patients meeting criteria as an OU from 30.1% in 2007 to 39.3% in 2014 (p<0.001). Preoperative opioid use was the strongest predictor for prolonged opioid use following TKA, with OU filling significantly less opioid prescriptions than NOU at every time point analyzed (Fig 1). Opioid users were 1.6 (83.4% vs. 52.2%), 3.0 (62.9% vs. 21.2%), and 4.9 (50.4% vs. 10.2%) times more likely to be filling an opioid prescription at one, two and three months postoperatively, respectively (p<0.05 for all). Younger age, female sex, and all other diagnoses analyzed were found to significantly increase the rate of opioid refilling following TKA throughout the entire postoperative year. For example, risk ratios (RR) with 95% confidence interval (CI) analysis demonstrated that patients with anxiety/depression were 1.7 times (1.6-1.7) more likely to be filing an opioid prescription at two to three months postoperatively. Additionally, RR (95% CI) for opioid refill rates at two to three months following TKA were 1.7 (1.6-1.7) for smokers, 2.3 (2.1-2.4) for drug dependence, 1.5 (1.4-1.7) for alcohol dependence, 1.4 (1.4-1.5) for myalgia, 1.5 (1.4-1.6) for low back pain, 2.1 (2.0-2.2) for age less than 50 years, and 1.1 (1.1-1.2) for females. Further subgroup analysis found that among only NOU, female sex, and age less than 50 years remained predictive of higher opioid refill rates during the first three months following surgery. Among only OU, all variables remained per predictive of higher opioid refill rates.

DISCUSSION AND CONCLUSION:
Approximately one-third of TKA patients use opioids within three months prior to surgery and this percentage has increased over 9% during the years included in this study. Preoperative opioid use was most predictive of increased refills of opioids following TKA. However, other intrinsic patient characteristics were also predictive of prolonged opioid use. These characteristics remained predictive after controlling for opioid user status. This data provides an important baseline for opioid use trends following TKA that can be used for future comparison while identifying risk factors for prolonged use that will be helpful to prescribers as we all work to decrease opioid use, misuse, and abuse.