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Title: Opioid Demand after Anterior Cruciate Ligament Reconstruction

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Objectives: Surgeons and healthcare systems have received a call to action in an effort to curtail the current opioid epidemic in the United States. Postoperative opioid demand after anterior cruciate ligament reconstruction (ACLR) is not well understood. The purpose of this study was to (1) define the natural history of opioid demand after ACLR performed with and without concomitant procedures and to (2) evaluate preoperative opioid demand as a risk factor for postoperative opioid demand.

Methods: Arthroscopic ACLRs performed in the Humana Inc. database between 2007-2014 were identified using CPT code 29888. Further categorization of procedures was performed by identifying patients who underwent ACLR with no other procedures, those who underwent ACLR with meniscus repair, those who underwent ACLR with menisectomy, and those who underwent ACLR with microfracture. Postoperative opioid demand was trended by month following surgery for 1 year. The effect of preoperative opioid demand on postoperative opioid demand was evaluated by comparing those who had filled preoperative opioid prescriptions with those who hadn't. Patients were considered preoperative opioid users if they had filled an opioid prescription in the 3 months preceding surgery. Relative risk of postoperative opioid use was calculated and 95% confidence intervals (CI) were determined.

Results: Over the course of the study period, 4,946 arthroscopic ACLRs were performed. Of these, 7.24% were still filling opioid prescriptions at 2-3 months after their procedure; 4.71% of patients were filling opioid prescriptions at 1 year after surgery. Patients undergoing ACLR with microfracture were at increased risk of filling narcotic prescriptions compared to the other procedure groups. At 4-5 months postoperatively, ACLR with microfracture had increased risk of filling narcotic prescriptions compared to ACLR alone 1.96 (CI=1.32-2.92), ACL with meniscus repair 2.38 (CI=1.46-3.88), and ACL with meniscectomy 1.51 (CI=1.03-2.23). Nearly 35% of patients (1,716/4,946) were taking opioid pain medications in the 3 months prior to ACLR. Those filling preoperative opioid prescriptions were 5.34 (CI=4.12-6.94) times more likely to be filling narcotic prescriptions at 2-3 months after ACL reconstruction. Those filling preoperative opioid prescriptions were 7.54 (CI=5.32-10.71) and 6.42 (CI=4.5-9.15) times more likely to be filling opioid prescriptions at 9 and 12 months respectively after ACLR.

Conclusion: Opioid demand after ACLR drops significantly in the vast majority of patients by the 3rd postoperative month. Surprisingly, 35% of patients undergoing ACLR were found to be using opioid medications preoperatively and we identify preoperative opioid use to be a strong predictor of postoperative opioid demand with a 5 to 7 fold increased risk in this patient population. Surgeons can

use this data when counseling patients on typical postoperative opioid demand. Surgeons and healthcare systems should be aware a large portion of patients undergoing ACLR are receiving preoperative opioid prescriptions which put these patients at increased risk for extended postoperative opioid demand. In the setting of preoperative care for patients who will undergo ACLR, healthcare providers should pursue non-opioid prescribing regimens in an effort to limit postoperative opioid demand.