Post-Operative Multimodal Analgesia is Associated with Reduced Opioid Prescriptions after Anterior Cruciate Ligament Reconstruction

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Background and Aims : Outpatient anterior cruciate ligament reconstruction (ALCR) is associated with severe post-operative pain and subsequent opioid use. To reduce risk of prolonged opioid use after ACLR, evidence provides strong rationale for optimizing the postoperative analgesia pathway. The present study compared a standard post-operative analgesia pathway to an enhanced pathway in which gabapentin and celecoxib were added to a combined short-acting opioid with acetaminophen. The study aim was to determine whether the enhanced pathway was associated with reduced opioid prescription doses and refills in the first 90 days following ACLR surgery.

Methods: Retrospective data of all primary ALCR cases in a facility (N=108) were divided into a Standard (n=55) and Enhanced (n=48) analgesic groups. Bivariate tests assessed group differences in demographic and clinical factors. Generalized linear models (GLMs) examined the effect of group on post-operative morphine-equivalence dose (MED) prescribing as well as number of post-operative opioid refills through 90 days post-operatively, while controlling for relevant covariates. Significance level was adjusted for two outcomes at p<0.025.

Table 1. Post-Operative Analgesia Group Differences Across Patient Characteristics

	Standard (n=55)	Enhanced (n=48)	SMD	Significance level
Age, median [IQR]	25.00 [22.00, 31.50]	26.00 [22.00, 32.25]	0.003	0.75
Male, n (%)	42 (76.4)	42 (87.5)	0.29	0.20
Active-duty Military, n (%)	39 (70.9)	45 (93.8)	0.62	0.004
Body Mass Index, median [IQR]	26.66 [24.17, 29.20]	27.39 [24.61, 29.72]	0.09	0.45
Weight kg, median [IQR]	85.40 [74.65, 93.05]	83.95 [75.62, 93.28]	0.08	0.76
Opioid prescription 90-days prior to surgery, n (%)	20 (36.4)	9 (18.8)	0.052	0.40

Note: Continuous variables were not normally distributed, and group differences were assessed with Mann-Whitney U tests. Categorical variable differences were assessed with Fisher exact tests. SMD=Standardized Mean Difference.

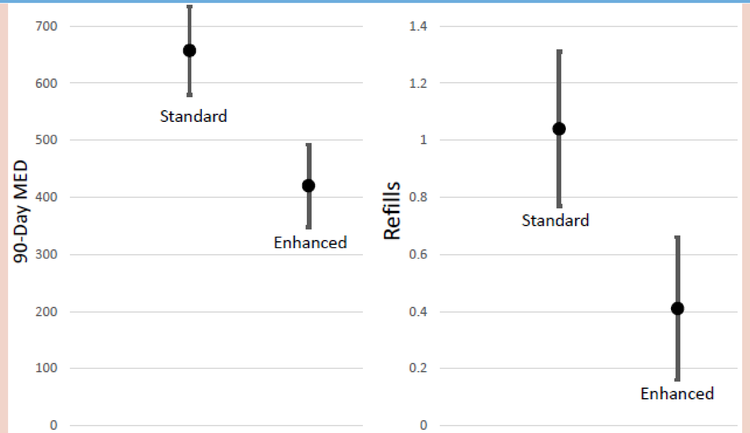

Figure 1. 90-Day Opioid Prescribing MED and Refills

Results: The Enhanced group (94%) had a higher percentage of military service members than the Standard group (71 %, p<.01). Surgical variables were similar except for increased surgical time in the Enhanced group (p<.05). GLMs controlled for military status and surgical time. 90-day post-operative MED prescribed [420 MED (95%CI 348, 492) VS. 657 MED (95%CI 580, 734), p<0.001] and number of post-operative opioid refills [.41 (95%CI .16, .66) VS. 1.04 (95%CI .78, 1.31) p<.001] were significantly lower in the Enhanced vs. Standard group respectively.

Conclusions: Increased utilization of post-operative gabapentin and celecoxib in addition to a short--acting opioid with acetaminophen was significantly associated with reduced total post-operative opioid prescribing and opioid refills in the first 90 days after ACLR surgery.

References: 1) Secrist, E.S., et al., Pain Management After Outpatient Anterior Cruciate Ligament Reconstruction: A Systematic Review of RCTs. Am J Sports Med, 2016. 44(9): p. 2435-47. 2) Harbell, M.W., et al.,Combined preoperative femoral and sciatic nerve blockade improves analgesia after anterior cruciate ligament reconstruction: a randomized controlled trial. J Clin Anesth, 2016. Sep;33: p. 68-74. 3) Anderson, M.J., et al., A Systematic Summary of Systematic Reviews on the Topic of the Anterior Cruciate Ligament. Orthop J Sports Med, 2016. 4(3): p. 2325967116634074.

This was an approved hospital quality assurance/process improvement project and was determined by the Tripler Army Medical Center Determination Board to not require Institutional Review Board approval. (GEARS-#819752). The views expressed in this abstract are those of the author(s) and do not reflect the official policy or position of Tripler Army Medical Center, Uniformed Services University, the Department of the Army, Department of Defense, or the U.S. Government.