

Reuben, SS, Ekman, EF. The Effect of Initiating a Preventive Multimodal Analgesic Regimen on Long-Term Patient Outcomes for Outpatient Anterior Cruciate Ligament Reconstruction Surgery. *Anesth Analg*. 2007;105:228-232.

The purpose of this study was to determine the efficacy of using a preventive multimodal analgesic technique on long-term patient outcomes for those receiving ACL surgery. This research has been done to demonstrate the effect of preemptive analgesics on post-operative pain that extends beyond the outpatient discharge from an ACL reconstruction. Research has been limited so far in its effort to look at postoperative pain in the long-term.

Two-hundred subjects receiving ACL reconstruction were recruited for this study. The study was randomized, double-blind, and placebo-controlled. Exclusion criterion included other ligamentous lesions, a history of previous surgery on the ipsilateral knee, evidence of chondral damage, an injury to the contralateral knee, complaints of patellofemoral symptoms, an acute ACL tear <30d, current opioid ingestion, or if there was a contraindication for NSAID use or oxycodone. The experimental group (n=100) received celecoxib 400mg whereas the control group (n=100) received a placebo 1-2 hours prior to surgical intervention. At that time, all patients were administered acetaminophen 1000mg. A bone-tendon-bone patellar tendon autograft was utilized as the ACL replacement technique. Once released from the hospital all patients took 1000mg acetaminophen every 6h and either celecoxib 200mg every 12h or the placebo for the first 14d. Furthermore, patients took oxycodone 5-10mg every 3h for a pain score of greater-than/equal-to 3. All patients participated in an accelerated rehabilitation program that emphasized full weight bearing and full knee extension on the first day postoperatively. The goal of this program was to return to full sports participation by 6mo. Patellofemoral complications were evaluated at 6mo post-operatively. Anterior knee pain, flexion contracture, quadriceps weakness, and chronic regional pain syndrome were all evaluated as potential complications. Postoperative level of activity at 6mo was also measured as compared to preoperative results by using the evaluation of the International Knee Documentation Committee.

Nine patients were unable to return for an assessment after 1mo postoperatively, leaving 191 subjects through the rehabilitation and long-term assessment. A Student's t-test was utilized for unpaired data as was the Mann-Whitney U-test for noncontinuous data. The Bonferroni corrections were applied for multiple comparisons and the alpha level was set to 0.05. It was found that significantly more subjects in the control group developed patellofemoral conditions. There was also a significant deficit in peak extension torques at 60, 120, and 180deg/s at 1 and 6mo postoperatively for the control group subjects. The experimental group reported significantly lower pain scores after isokinetic testing at both 1 and 6mo. Also, more subjects in the experimental group returned to a Grade 3 / 4 activity level and could participate in more intense activities and return to full athletic activity compared to the control.

The strength of recommendation using the SORT is an A due to the good-quality patient-oriented evidence. Using the *AAOS Levels of Evidence for Primary Research Question* this research is given a level 1. The conclusions drawn from this research are clinically relevant to Athletic Training in that it may be possible to progress ACL postoperative rehabilitation programs more quickly for patients if it is known that a multimodal analgesic regimen was utilized. The Athletic Trainer may also be able to use this information to use more aggressive exercises in the therapy program knowing that patellofemoral complications would also be of lesser risk. Patient education would include informing them of what a multimodal treatment will do to decrease their pain postoperatively and how their long-term outcomes (and return-to-play) may improve compared to an analgesic regimen that was designed differently.