

## Functional response to pain and its treatment in knee osteoarthritis

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Osteoarthritis (OA) is one of the most common sources of musculoskeletal pain. It is generally accepted that in response to a painful stimulus there will be a modification in movement to reduce or avoid this pain. There are very few studies looking at the potential for pain treatment to change movement mechanics in OA. Yet this information is important as the functional response to OA pain treatment can alter the mechanical environment of the joint and thus may impact the efficacy of treatment. Our recent work has shown a sensitivity of joint loading measures to repeated pain treatment washouts<sup>1</sup> and to the mechanism of action of the pain treatment<sup>2</sup>. However, there remains a paucity of information relating kinematic coordination and variability of movement to pain modifications.

A single-blind washout, double-blind treatment, double-dummy cross-over pilot study using placebo, Oxycodone and Celecoxib was used to test the hypothesis primary and secondary movements of the knee are significantly different for the two active drug treatments compared to a double blind placebo treatment. Walking kinematics data were collected at self-selected normal pace at the beginning of each arm of the cross-over study design.

Significant differences between Placebo and Celecoxib arms were found for the mean internal-external knee rotation angle ( $p < 0.05$ ) while changes in flexion and anterior-posterior translation did not reach significance. In a post-hoc analysis the change in knee internal-external rotation was correlated with the change in internal-external rotation ( $r^2 = 0.33$ ) and total reaction moments ( $r^2 = 0.66$ ). There were no differences in walking speed or step-length for any treatment.

The differential kinematic response to the treatment arms suggests a potential difference in the impact of these drugs on ambulation and the motor system response to the mechanism of action of pain treatment.

### Reference List

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- (2) Boyer KA, Angst MS, Asay J, Giori NJ, Andriacchi TP. Sensitivity of gait parameters to the effects of anti-inflammatory and opioid treatments in knee osteoarthritis patients. *J Orthop Res* 2012;30:1118-1124.