study were to evaluate the feasibility and outcome of the newly developed protocol.

Methods: Forty-nine patients with knee osteoarthritis and severe knee pain (NRS≥7) were included in this study. Analgesics were prescribed following an incremental protocol. The incremental steps were (1) acetaminophen, (2) NSAIDs, (3) weak opioids and (4) an intra-articular steroid injection. After six weeks a supervised exercise therapy program for 12 weeks was added, consisting of muscle strengthening exercises and training of daily activities. Feasibility was evaluated by information about analgesics, pain reduction, exercise therapy content and the opinion of patients, rheumatologists and physical therapists. Knee pain was assessed with NRS-pain and activity limitations were assessed with WOMAC-PF. Data were collected at baseline, after six weeks, and after 18 weeks.

Results: Eighty-two percent of the patients were able to exercise according to the protocol. In intention-to-treat analyses statistically significant and clinically relevant improvements in pain (mean change 30% from baseline, p<0.001) and activity limitations (mean change 15% from baseline, p<0.001) were found after the combined intervention protocol with analgesics and exercise therapy. Improvements in pain (p<0.001) and activity limitations (p=0.002) were found after six weeks of analgesic use. Further improvements in pain (p<0.001) and activity limitations (p=0.004) were found after twelve weeks of exercise therapy in per protocol analyses in patients who were able to exercise according to the protocol.

Conclusions: The combined intervention of analgesics and exercise therapy allows most patients with knee osteoarthritis and severe pain to participate in exercise therapy, leading to reduction of pain and activity limitations. Although the results are promising, they need to be confirmed in a randomized controlled trial.

611
GAIT BIOMECHANICS AND FUNCTIONAL OUTCOMES AS PREDICTORS OF RESPONSE TO A HIP STRENGTHENING EXERCISE PROGRAM IN KNEE OSTEOARTHRITIS PATIENTS

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Purpose: Muscle strengthening exercises have been shown to improve pain and function in adults with mild-to-moderate knee osteoarthritis (OA), but individual responses can vary widely. The ability to predict which individuals will and will not respond to a therapeutic intervention is important in developing a more efficient and effective model of care for knee OA. Therefore, the purpose of this study was to use pre-intervention gait kinematics and self-reported clinical measures to predict the post-intervention response to a 6-week hip strengthening exercise program in mild-to-moderate knee OA patients. A secondary purpose was to examine long-term changes in intervention outcomes for a subset of OA patients 3 years later.

Methods: Thirty-four mild-to-moderate knee OA patients completed a 6-week hip strengthening program and were sub-grouped as Non-Responders, Low-Responders, or High-Responders, following the exercise intervention, based on their change in self-reported clinical measures. Predictors of subgroup membership were retrospectively determined from pre-intervention kinematic (sagittal and frontal kinematics at the hip, knee, and ankle) and clinical parameters (Knee Injury and Osteoarthritis Outcome Score subscales). Principal component analyses were used as a data reduction technique and the resulting principal components were cumulatively entered into a linear discriminant analysis by order of highest effect size. The best classification model was determined by selecting the combination of principal components that displayed the greatest leave-one-out classification accuracy. This classification model depicted a two-dimensional subspace of combined kinematic and clinical parameters.

To address the secondary purpose, follow-up data were collected at an average of 3.5 (6.3) years later, on a subset of 16 individuals from the knee OA group. The combination of kinematic and clinical parameters were projected into the classification model subspace in order to compare post-intervention, 3 year follow-up data, and control subjects with baseline results.

Results: A unique combination of clinical and kinematic factors was able to successfully subgroup knee OA patients with a leave-one-out classification accuracy of 85.3% (Figure 1). The first discriminant function was primarily related to clinical scores, while the second discriminant function was primarily related to kinematic data. Specifically, hip frontal plane motion during stance and swing, along with the loading

response at the knee were loaded on the second discriminant function. These results show that High-Responders had greater pain, lower function, and altered hip mechanics and knee loading response upon entering the hip strengthening intervention. Figure 2 shows that all subgroups moved towards controls following the intervention, but the greatest movement occurred in High-Responders. The 3 year follow-up data showed that High-Responders became more similar to controls, while other subgroups regressed away from controls in the classification subspace (Figure 2).

Conclusions: The best classification model to predict responders to a hip strengthening exercise program included both clinical and gait data. Further, those who responded best to the exercise intervention tended to maintain these positive changes long-term, while those who did not respond well progressed further from pain-free controls. Although further validation is required, this research is a significant first step in developing an objective system to help clinicians make evidence-based decisions regarding optimal treatment and long-term outcomes.
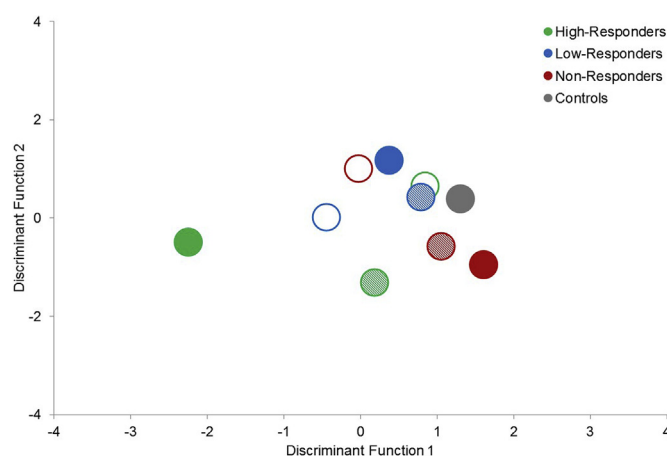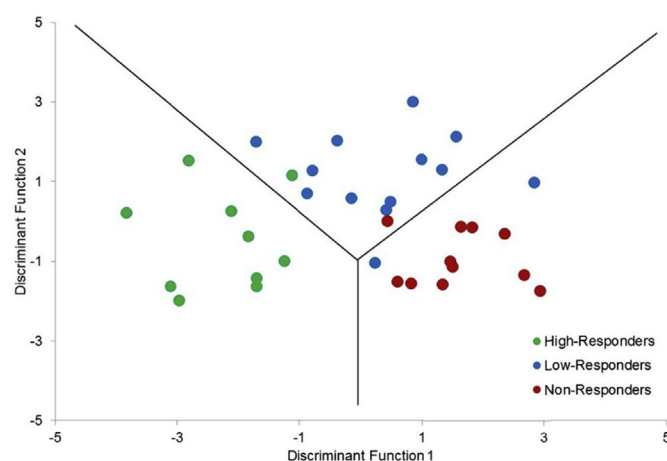
612
A FEASIBILITY TRIAL FOR THE EFFICACY OF PHYSIOTHERAPY INTERVENTION FOR EARLY-ONSET HIP OSTEOARTHRITIS

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Purpose: Early hip osteoarthritis (OA) is commonly seen in people undergoing hip arthroscopy and is associated with increased pain, reduced ability to participate in physical activity and reduced quality of life. Despite this, the efficacy of non-surgical interventions such as exercise therapies for patients with early hip OA remains unknown. The primary aim of this study was to establish the feasibility of a randomised controlled trial (RCT) investigating a targeted physiotherapy intervention