

## May Literature Reviews

**Mansell, Nancy S. et al. "Arthroscopic Surgery Or Physical Therapy For Patients With Femoroacetabular Impingement Syndrome: A Randomized Controlled Trial With 2-Year Follow-Up." *The American Journal of Sports Medicine* 46.6 (2018): 1306-1314. Web.**

Review Submitted by: Katie Long, PT, DPT

**Objective:** To investigate 2-year outcome comparisons in those with FAIS who underwent arthroscopic surgery or supervised physical therapy program and the respective effects on self-reported disability, costs and return-to-work status.

**Methods:** Patients between the ages of 18-60 were selected from a military population after meeting the clinical criteria for FAIS and being deemed surgical candidates. Patients who had surgical or rehabilitation preferences and were unwilling to be randomized into groups were not included. The two primary reasons for exclusion were not wanting surgical intervention, or leaving the military duty station within 6 months. The surgical group received an acetabuloplasty, labral repair/debridement, or femoroplasty or a combination of the interventions as indicated by the surgeon's clinical judgement. The physical therapy group participated in a program consisting of 2 visits a week for 12 sessions (specific PT protocol has been previously published by Mansell et al.). Outcomes were obtained at 6 months, 1 year and 2 years out. Primary outcome assessed at 2 years was the Hip Outcome Score (HOS); the International Hip Outcome Tool (iHOT) and Global Rating of Change (GRC) were also assessed. Perceived improvement and self-efficacy were assessed through the outcome measures in addition to utilization of the Self-Motivation Inventory and the Pain Catastrophizing Scale. Healthcare costs was addressed with the MHS Data Repository (MDR).

**Results:** 40 patients were randomized to each group, 38 of the surgical group ended up undergoing surgery and 28 of the rehab group underwent surgery during the course of the study. At baseline, there was no difference between groups in all measures assessed. There was a statistically significant improvement in the HOS ADL subscale from 1-year to 2-year follow ups within the physical therapy group only, which met the MCID. There was no significant difference between groups in the iHOT at 2 years. There was no difference between groups in the HOS ADL and sport subscales or the iHOT-33 at any time points. There was a within group improvement from baseline to 1 and 2 year HOS ADL and iHOT-33 in the assigned surgery group, which met the MCID. There was no difference between groups in perceived improvement. Mean healthcare costs between the 2 original groups was not significantly different. Half of the original 72 active duty participants were still active duty at 2 year follow up, with equal distribution between groups.

**Conclusions:** There was no significant difference in outcomes between groups at 2 years, and the mean patient perception regarding their condition was no improvement. There was a high rate of crossover between the rehabilitation group to surgical intervention. Even when accounting for those who crossed over, there was no significant difference in group outcomes

(although concerns of the power of the study being influenced is addressed). Each patient was evaluated by the participating orthopedic surgeon, therefore potential bias to the participants and of the surgeon is discussed. 12 patients underwent more than 1 surgery, 9 patients were diagnosed with osteoarthritis, 1 case of fracture and 1 case of heterotrophic ossifications were observed throughout the course of the study. 33% of participants were medically separated from the military in relation to their hip, however numbers were the same in each group. Several limitations were discussed such as a single site for the study, predominantly military population, single surgeon, small group of therapists providing PT intervention, and the clinical pathway of the study design and potential related bias.

**Commentary:** This article may be used as a valuable patient education tool for increasing buy in. The results suggest that there is no statistical difference in those who underwent surgery as compared to those who did in a variety of outcomes, including patient perception. Although the patient population may be a limiting factor in generalizability, this study still provides valuable information clinically. The crossover rate is concerning considering the final comparison was 66 participants who underwent surgery vs 14 who did not. The clinical course of the design of the study is something the authors addressed as a concern for bias. However we often see patients who have already been evaluated by an orthopedic surgeon, therefore I believe this represents a familiar clinical scenario.

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**Esculier JF, et al. Is combining gait retraining or an exercise programme with education better than education alone in treating runners with patellofemoral pain? A 2 randomized clinical trial. Br J Sports Med. 2018;52(10):659-666.**

**Review Submitted By:** Tyler France, PT, DPT, CSCS

**Objective:** The purpose of this study was to compare the effects of three 8-week rehabilitation programs (education, education and exercise, education and gait retraining) on symptoms and functional limitations of runners with patellofemoral pain (PFP).

**Methods:** Sixty-nine runners with PFP were randomly assigned to one of three intervention groups: education on symptom management and training modification, exercise program in addition to exercise, and gait training in addition to education. Participants had to be aged 18-45 years, report a minimal weekly running distance of 15 km, present with PFP of at least 3 months, experience a minimum of 3/10 pain during running and other tasks, and score a maximum of 85/100 on the KOS-ADLS. Runners were excluded if they presented with symptoms following an acute trauma, symptoms believed to originate from patellar tendon or menisci, concurrent lower limb injuries, history of patellar dislocation or lower limb surgery, or presence of rheumatoid, neurological, or degenerative diseases. Symptoms and functional limitations were assessed at baseline, and after 4, 8, and 20 weeks using the KOS-ADLS and VAS for pain, worst pain, and pain during running. Lower limb kinematics and kinetics during running and isometric hip and knee strength were also assessed at baseline and after 8 weeks.

**Results:** All three groups demonstrated similar improvements at 4, 8, and 20 weeks compared with baseline, though there was no significant difference between the three groups. Only the exercise group increased knee extension, hip external rotation, and hip abduction strength at the 8 week follow up and only the gait retraining group increased step rate (+7.0%) and decreased average vertical loading rate (-25.4%).

**Conclusions:** Gait retraining and exercises targeted at strengthening the lower extremity improved their targeted mechanisms. However, their addition to education did not provide additional benefits on symptoms and functional limitations. Appropriate education on symptoms and management of training progression should be a primary treatment tool in runners with PFP.

**Commentary:** Because training errors so often contribute to symptom onset in runners with PFP, education on appropriate modification of training load is a critical intervention in this population. In this particular study, modifications according to symptoms was ensured through repeated PT feedback and guidance. Avoiding hills, stairs, and splitting total weekly distance into more frequent, but shorter sessions may have allowed study participants to maintain appropriate PFJ loads and experience symptom improvement over time. Though the gait retraining group did not achieve more benefit than the other groups in symptoms and function, they were able to significantly reduce average vertical loading rate and PFJ average loading rate which could be beneficial for maintaining PFJ health in the long term. Prior research has shown that a multi-modal approach is the most effective approach for treating PFP. After studying this article, I will be more intentional with my education when working with these patients.

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**Luomajoki HA, Bonet Beltran MB, Careddu S, Bauer CM. Effectiveness of movement control exercise on patients with non-specific low back pain and movement control impairment: A systematic review and meta-analysis. Musculoskelet Sci Pract. 2018 Mar 28;36:1-11. doi: 10.1016/j.msksp.2018.03.008. [Epub ahead of print].**

**Review Submitted by:** Sarah Bosserman, PT, DPT, CSCS

**Objective:** To determine the effectiveness of movement control exercise (MVCE) compared to the alternative interventions in terms of disability and pain intensity on patients with non-specific low back pain.

**Methods:** Four electronic databases were searched from review inception to April 2017. Randomized controlled trials comparing MVCE with other active interventions were included. Participants selected were adults with non-specific low back pain (NSLBP). There were no restrictions on duration, frequency, or intensity of the intervention. Outcomes assessed were disability (PSFS, ODI, RMDQ) and pain intensity (VAS, NPRS, GCPS, McGill NPI) at 3 and 12 months. Individual studies were rated using the PEDro scale and the quality of evidence for the meta-analysis was assessed using the GRADE approach. The mean values and standard

deviations were compared between groups at the end of the treatment and after a 12-month follow up.

**Results:** A total of 11 studies were included in the analysis for a total of 781 participants. The duration of LBP symptoms ranged from subacute to chronic (pain for 12 months or more). All studies, except for one, were of high quality ( $\geq 5/10$  on the PEDro scale). GRADE assessment revealed quality of evidence was very low to moderate for studies that restricted their sample to participants with a movement control impairment (MVCI) and very low for studies with no restricted sample. The total effect over all studies showed a small effect in favor of MVCE treatment for pain reduction and studies that restricted the sample to those with MVCI showed a large effect in favor of MVCE (SMD-0.82, 95%CI-1.25 to -0.40). After 12-months, only the studies that restricted their sample showed a small effect in favor of MVCE treatment. For disability measures, the total effect over all studies showed a small effect in favor MVCE treatment and those that restricted their sample to those with MVCI showed a moderate effect in favor of MVCE (SMD-0.66, 95%CI -1.18 to -0.13). At 12-month follow-up, total effect over all studies showed a small effect in favor of MVCE treatment and studies that restricted their sample to those with MVCI showed no tendency in favor of the MVCE or control intervention for disability outcomes.

**Conclusions:** Movement control exercise treatment may be more effective in improving disability in the short and long term for patients with non-specific low back pain and a movement control impairment when compared with other interventions (general exercises, weight training, or stabilization training). Pain was reduced in the short term, but not in the long term. Due to the small sample sizes, considerable heterogeneity of the studies, and other factors (such as pain duration) that may be equally important, the authors recommend future studies paying close attention to duration of NSLBP and presence of MVCI to improve confidence in the data.

**Commentary:** The authors of this review described MVCI as an “alteration of the spinal alignment and movement pattern in a specific direction” that occurs secondary to “the presence of pain and can be due to abnormal tissue loading, lack of proprioceptive awareness and, possibly, the lack of a withdraw reflex motor response”. As clinicians, and has indicated by this review, the better we can identify those with potential movement control impairments, the more effective our treatments will be on both pain and disability. Some factors not fully addressed in this review include the potential impact of chronicity, psychological, social, and neurophysiological factors that be impacting their symptoms. Future studies that subgroup patients by duration of pain and specific clinical classification may lead to higher quality evidence for specific interventions.

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**Senorski E, Svantesson E, Beischer S, Thomee C, Thomee R, Karlsson J et al. Low 1- year return to sport anterior cruciate ligament reconstruction regardless of patient and surgical factors. Am J Sports Med. 2018; 46:1551-1558.**

**Review submitted by:** Jennifer M. Boyle

**Objective:**

The purpose of this study was to identify actors that can predict RTS 1 year after ACL reconstruction in terms of patient characteristics, intraoperative identified concomitant injuries, and graft choice.

**Methods:**

A prospective cohort study of 272 patients was conducted. The protocol utilized consisted of two parts. 1 surgeon reported section (activity performed at time of injury, time from injury to reconstruct, graft selection, his/her opinion and surgical fixation technique) and 1 patient reported section. Patients were evaluated 12 months after ACL reconstruction and Tegner activity scale  $\geq 6$  were chosen. No prior knee surgery or postoperative infections were included. Evaluations of isometric or isokinetic knee extension and flexion strength and 3 hop tests (1 legged for distance, vertical jump and side hop test) were performed.

**Results:**

Of the 442 eligible patients, 272 fulfilled the inclusion criteria. Patient sex was evenly distributed. A total of 155 (57%) patients made a RTS 1 year after ACL reconstruction. Of these patients a majority of them were male and younger on average at the time of the reconstruction as compared to the non- RTS patients.

**Conclusions:**

Male patients at a younger age and higher preinjury level of physical activity with no reported concomitant injury to MCL or meniscus had a higher RTS rate 1 year after an ACL reconstruction.

**Commentary:**

Although the goal may be to RTS post ACL reconstruction this article shows the prevalence of certain characteristics that RTS more successfully than others. Creating realistic expectations for patients is a very important goal of physical therapy and I believe this article is a tool to be utilized for ACL recovery situations in which RTS may not be the path most beneficial for that patient. Since starting residency my perception on ACL recovery time has been altered to resemble this article as opposed to how fast I used to think recover was. Specifically, after the running medicine conference I realized that it takes much longer to RTS or initiating running program than I initially anticipated. This article solidifies these guidelines for me and will help me further shape expectations for patients and myself after an ACL reconstruction.

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**Assessing Outcomes in People with Chronic Ankle Instability: The Ability of Functional Performance Tests to Measure Deficits in Physical Function and Perceived Instability. Madsen LP, et al. J Orthop Sports Phys Ther 2018; 48(5):372-380.**

Review submitted by: Justin Pretlow, DPT, OCS

**Objective:** Identify Functional Performance Tests (FPT) that can differentiate individuals with unilateral CAI from healthy controls and accurately identify functional and perceived instability asymmetries in subjects with unilateral CAI.

**Methods:** 24 (10 male, 14 female, mean age 20.1) healthy control subjects and 24 (10 m, 14 f, mean age 20.7) subjects with unilateral CAI were matched according to sex, height, mass, and limb length. Each subject performed a 5 min bike warm-up, optional additional stretching, followed by the Functional Performance Tests (5 unilateral hopping tests). 3 FPT's were measured for time: Side hop, 6-meter crossover hop, figure-of-eight hop. 2 FPT's were measured for distance: triple crossover hop, lateral hop. Perceived ankle instability was measured using a 0-100 VAS in which subjects were asked "How unstable did your ankle feel during the test?" after 3 successfully completed trials of each FPT.

**Results:** No significant difference was found in limb symmetry indexes between healthy and CAI subjects. The CAI group perceived more instability in the involved limb during 4 of the FPT's – side hop, 6-meter crossover hop, lateral hop and the figure-of-eight hop. No significant difference was perceived during the triple crossover hop.

**Conclusions:** Subjects with CAI experience significant feelings of instability when performing unilateral hopping tests, even if the involved limb appears functionally normal. Implementing a VAS for perceived instability during FPT's may be useful in determining the success of a rehab protocol vs. evaluating functional improvement alone. The physical therapist may be able to utilize interventions aimed at improving subjective reports of instability throughout the rehab process.

**Commentary:** The authors found that despite feeling unstable, the subjects with CAI produced very similar FPT outcomes bilaterally and compared to healthy controls. They make an interesting point that individuals with CAI may not experience functional deficits at all, but rather their long term deficits/outcomes may be heavily influenced by perceived instability, fear of re-injury, and decreased participation in exercise. This makes me wonder if discussion of the limb symmetry numbers with a CAI patient can help change their perception of instability. This also makes me wonder if using video feedback demonstrating how similar the involved/uninvolved limb look during hopping tests can impact the patient's perceived instability while performing the tests, for example, during the next physical therapy session. Other articles we've discussed recently have pointed out the limitations of FPT's in assessing readiness for return to sport post ACL reconstruction – and my take away was that FPT's should be considered with caution on their own, but can be helpful if taken as a small piece of the return-to-sport pie. Similarly, the results of the FPT's for the CAI subjects in this study would have you believe they have no significant deficits. So, the author's idea of supplementing this data with a VAS rating of perceived instability could help the clinician address the important subjective factors of CAI. A limitation of the study to consider is the authors could not control for the types of physical activity each group/subject regularly performs. The average reported for both groups was over 200 mins of weekly exercise at an average intensity of 6 on the Likert

scale of 0-10. But there is no way to know if the types of exercise subjects in each group were accustomed to had any impact on their FPT scores.