

sprains, and biceps brachii DOMS. Significant limitations of the studies included exist, and most of the studies only assessed shortterm effects.

Commentary: Needling treatment is becoming increasingly popular and supported by litigation, as its effects are better understood to include changes in the muscle function and biochemical response. With the ability to alter these factors, it'd make sense to extrapolate the idea that needling can be effective in improving muscle force production for a variety of pathologies. As clinicians, we need to choose a treatment that is the least invasive with the most effective outcome. This review provides a guide to treatment prescription, not supporting the use of needling for pathology aside from non-specific neck pain which is also supported in the clinical practice guidelines for chronic neck pain.

Citation: Schröder C, Skare Ø, Reikerås O, Mowinckel P, Brox J. Sham surgery versus labral repair or biceps tenodesis for type II SLAP lesions of the shoulder: a three-armed randomised clinical trial. *British Journal of Sports Medicine*. 2017;51(24):1759-1766. doi:10.1136/bjsports-2017-098081.

Review Submitted By: Jon Lester

Objective: To evaluate the effects of a labral repair and biceps tenodesis in patients with Type II SLAP tear.

Methods: 118 surgical candidates with confirmed Type II SLAP tears, who failed conservative therapy, were recruited for this study. Once the Type II SLAP tear was confirmed during arthroscopic surgery, each patient was randomized into one of three groups: 1) labral repair, 2) biceps tenodesis, and 3) sham. Each patient was asked to wear a sling for 3 weeks post. Post-op PT was performed for each individual for 3-6 months with a pragmatic approach. Outcome measures were the Rowe Score and WOSI at 3, 6, 12, and 24 months. Additional outcomes were the OISS, the EuroQol, and change of pain from baseline to all follow-ups. The authors reported that the “primary outcomes” were the Rowe Score and WOSI at 6 and 24 months post-op. All other outcome measures and time points were “secondary outcomes”. All patients, physical therapists, and outcome measure assessors were blinded to group allocation.

Results: There were no between group differences in the above outcome measures between the three groups at the “primary outcome” time stamps of 6 and 24 months post-op. All secondary outcomes followed the same trend of no between group differences. All groups significantly improved in each outcome measure at 6 and 24 months post-op. In the sham group, 31/37 (84%) patients reported excellent or good results at 1-year follow-up, in the labral repair and biceps tenodesis groups the numbers were 29/35 (83%) and 34/38 (89%), respectively.

Conclusions: In this group of subjects with isolated Type II SLAP tears, there was not a significant difference in the improvement at 6 or 24 months post-op when comparing presence of sham surgery to labral repair or biceps tenodesis. All subjects improved regardless of group

allocation.

Commentary: The main reason I chose this article was because I have a patient who is strongly considering receiving surgery for her diagnosed SLAP tear. We have had extensive discussion on her current symptoms and their trends since her start of PT (I've seen her 3 sessions now). Despite improvements in ROM and tolerance to various ADL, she still believes that surgery will be required to be completely pain free. This article provides me with some evidence that I could discuss with her (and other patients) on the effectiveness of surgical intervention for this injury specifically. For patients that are consistently asking about the pro's/con's and potential benefits of surgery, having more opportunities to provide them with current evidence is advantageous.

Fernández-de-las-Peñas, C. et al. (2019). Cost-Effectiveness Evaluation of Manual Physical Therapy Versus Surgery for Carpal Tunnel Syndrome: Evidence From a Randomized Clinical Trial. *Journal of Orthopaedic & Sports Physical Therapy*, Vol (49): 2; 55-63.

Review Submitted by: Cameron Holshouser, PT, DPT

Objective: To evaluate differences in cost-effectiveness of manual therapy versus surgery in women with CTS.

Methods: Randomized controlled trial, 120 females with clinical and electromyographic diagnosis of CTS were randomized to either manual physical therapy or surgery. Interventions consisted of 3 sessions of manual therapy or surgical decompression/release of the carpal tunnel. Trial took place in Madrid, Spain. Societal costs and health-quality of life (EQ-5D scale) over 1 year were used to generate incremental cost per quality-adjusted life year ratios for each treatment. Inclusion criteria clinical signs: pain and paresthesia in the median nerve distribution, increasing symptoms during the night, positive Tinel sign, and positive Phalen sign. Symptoms had to have persisted for at least 12 months. The electrodiagnostic examination had to reveal deficits of sensory and motor medial nerve conduction. Exclusion criteria: sensory motor deficit in the ulnar or radial nerves; older than 65 years of age; previous hand surgery or steroid injection treatment; multiple diagnoses on the upper extremity; cervical, shoulder and/or upper extremity trauma; any system disease causing CTS (DMII, thyroid disease); comorbid musculoskeletal medial conditions (RA, fibromyalgia); pregnancy; or presence of depressive symptoms. Interventions and results were based on a previous study conducted by the researchers:

https://ac.els-cdn.com/S1526590015008160/1-s2.0-S1526590015008160-main.pdf?_tid=626dea62-95e7-45a9-ad9f-39d1397c0369&acdnat=1550862928_cda012afadf1a37947b1b7aa26162f11).

Results: 118 patients, Incremental quality-adjusted life years showed greater cost-effectiveness in favor of manual therapy (difference, 0.135; 95% CI: 0.134, 0.136). Manual therapy was significantly less costly than surgery (mean difference €2576; $P < .001$). Patients in the surgical group received a greater number of treatments and made more visits to medial doctors than those receiving manual physical therapy ($P = .02$). Absenteeism from paid work was significantly

higher in the surgery group ($P < .001$). The major contributors to societal costs were the treatment protocol (surgery versus manual therapy mean difference, €106,980) and absenteeism from paid work (surgery versus manual physical therapy mean difference, €42,224).

Conclusions: Manual physical therapy has been shown to be more cost effective than surgery for women with CTS. From a cost-benefit perspective, physical therapy vs surgery intervention should be considered.

Commentary: 3 sessions, lasting 30-minutes in duration once a week showed to have better clinical outcomes with physical therapy for pain and function, and similar outcomes in the long term when compared to surgery in the study's previous publication. This study took those results and found that physical therapy is also more cost effective (which makes sense when you consider the cost of surgery, MD and PT visits). However, I think this study is great to show a specific patient population who is considering surgery without physical therapy. We can potentially show that person that you can have similar long-term outcomes and a reduction in costs with a few weeks of physical therapy. Limitations include: results were collected in Spain who has a different healthcare system; no control group; this study did not look at the short and medium term costs, only long term costs.

Martino, A. D., Matteo, B. D., Papio, T., Tentoni, F., Selleri, F., Cenacchi, A., Filardo, G. (2019). Platelet-Rich Plasma Versus Hyaluronic Acid Injections for the Treatment of Knee Osteoarthritis: Results at 5 Years of a Double-Blind, Randomized Controlled Trial. *The American Journal of Sports Medicine*, 47(2), 347–354.

Review Submitted By: Jeff Peckins

Objective: The purpose of the randomized control trial (RCT) is to compare the long-term outcomes of platelet-rich plasma (PRP) injections to hyaluronic acid (HA) injections in patients with knee osteoarthritis (OA).

Methods: The study used the same 192 individuals with knee OA who were in a previous RCT. The authors prospectively followed-up with these individuals for five-years after receiving a PRP or HA injection. Outcome measures included were the International Knee Documentation Committee (IKDC), visual analog scale (VAS), Tegner score, and reintervention (surgery or another injection). The RCT defines two years as mid-term and five years as long-term.

Results: The PRP group showed a statistically significant improvement in IKDC scores VAS score, and Tegner scores for up to 24 months following the injection, compared to their baseline scores. After 24 months, all outcomes were statistically higher than baseline values, but gradually returned to baseline values after this point.

The HA group showed a statistically significant increase in IKDC scores and Tegner scores up to 24 months, and similar to the PRP group, gradually returned to baseline values after this point in time. For VAS, there was not a statistically significant improvement, and scores were worse at the final follow-up compared to baseline.

Both PRP and HA demonstrated improvements in decreasing knee OA symptoms. The median duration of beneficial effect for the PRP group was 3 months longer than the HA group (12 vs 9), however this wasn't statistically significant. There was however a statistically significant difference in favor of the PRP group for reintervention rate at two years ($p = 0.036$). There continued to be a benefit of a decrease in reintervention rate in favor of the PRP group after this point, but it was not statistically significant.

Conclusion: There was not a statistically significant difference in long-term outcomes comparing PRP to HA injections.

Commentary: PRP has been gaining popularity within the past decade, and many are choosing this injection over the traditional HA injection. This study states that prior research has not determined PRP's effect beyond 12 months. In addition, previous RCTs had major flaws such as not blinding patients to their received intervention. This study is useful because it follows patients for five years, which is more meaningful for long-term success with an injection. The results between the two injections were very similar, except for decreased reintervention rate by the PRP group.

This RCT is relevant to physical therapists, as patients oftentimes ask for advice on how to best manage their knee OA symptoms. If a patient asks about PRP vs another injection therapy, the results of this RCT would not recommend one injection over the other. Both injection groups demonstrated statistically significant improvements in outcome scores for two years, however after this point outcome scores gradually returned back to baseline. Knowing this may help set patients' expectations for efficacy of these injections. The study did not mention if any of these patients had physical therapy (PT), and although this may have gone beyond the scope of the RCT, it would have been beneficial to determine if PT utilization had any effect of patient outcomes. The results of this study may help with PT buy-in, as PT following an injection may be a time to improve strength, mobility, and functional deficits in these patients to hopefully set them up for more long-term success.

Citation: Bernet BA, Peskura ET, Meyer ST, Bauch PC, Donaldson B. The effects of hip-targeted physical therapy interventions on low back pain: A systematic review and meta-analysis. *Musculoskelet Sci Pract.* 2019;39:91-100.

Review Submitted by: Matt Fung PT, DPT, CSCS

Objective: The purpose of this study was to investigate the effectiveness of adding physical therapy interventions performed at the hip to standard conservative treatment of LBP in improving outcomes of pain and disability.

Methods: Systematic review conducted through electronic databases: PubMed, CINAHL, Scopus, Web of Science, and SPORTDiscus. Searches were limited to peer-reviewed randomized controlled trials on adults (aged greater than 18 years) and published in English. Medical Subject Headings were used for the keywords: Low Back Pain, Physical Therapy Modalities, and Hip. The following inclusion criteria were required to be met: (1) randomized controlled trials; (2) populations with diagnosed low back pain; and (3) interventions that target the hip joint. Studies that included post-surgical participants or with complications from prior surgical procedures were excluded from this meta-analysis. Two researchers independently screened titles, abstracts, and full texts for inclusion. A third researcher was contacted if disagreement persisted.

Results: Six articles with a total of 387 participants were included in the review and meta-analysis. Specific intervention categories that were found in the search included: hydrotherapy (n=1); exercise therapy (n=4); and manual therapy (n=2). Trivial effect size was found for the pain outcomes and small effect size was found for disability. All of these studies were found to have high risk of bias according to Cochrane Risk of Bias tool due to lack of appropriate blinding of participants, personnel, or outcome assessors.

Hydrotherapy: one study incorporated aquatic resisted hip extension, flexion, abduction, and adduction. Patients participated in treatment 5x/wk for 4 weeks, with hydrotherapy exercises lasting 40 minutes. The control group received 60 minute HEP including ROM, stretching, strengthening and aerobic exercises performed daily for 4 weeks for 15-20 reps.

Exercise therapy: six-week program conducted by Kendall et al. consisting of 42 therapy sessions. Control group received a lumbar motor control program and experimental group received lumbar motor control program plus hip strengthening exercise – no dosage noted. Another study by Lee et al. control group received four closed chain lumbar stabilization exercises. The experimental group performed open-chain hip joint exercises using slings and resistance theraband for all planes of hip motion. Exercises were performed for 20 minutes 3x/wk.

Manual therapy: six- week program study by Ju et al. included 40 minute sessions 3x/wk. Experimental group received 30s bouts of hip distractions and other mobilizations. Control group received modalities including hot pack, ultrasound and e-stim. Another study by Bade et al. experimental group received pragmatic LBP interventions, which were most appropriate for the patients' needs. Experimental group received both pragmatic LBP treatment and prescriptive hip interventions. Manual therapy dosage was one bout for 30 s for each technique with grade III-IV mobilizations. Both groups also received a lumbar spine targeted HEP, but the experimental group also received three exercises that targeted the hip.

Conclusions: The meta-analysis from the pooled studies did not result in statistically significant reductions in either pain or disability with the addition of hip-targeted physical therapy interventions to patients with LBP.

Commentary: This was the first systematic review that looked specifically at how hip-targeted interventions affect LBP. While no statistically significant reductions in pain or disability with the addition of targeted hip interventions to patients with LBP, I think it brings up a great discussion with exercise prescription or manual techniques for our patients who do suffer from LBP. As discussed during last weekend's class, it is easy for us as clinicians to classify patients with low back pain into groups and give them the basic "low back pain" exercises (i.e hooklying TA, bridges, SKTC, etc.). This may be why adding simple hip interventions did not yield significant results in these studies. Additionally, this study notes many limitations in regards to sample size and number of studies included due to their inclusion criteria. Thus only 387 subjects were included in the six studies reviewed. My biggest takeaway is that further research needs to be done in regards to hip-targeted interventions for low back pain. With back pain being a large majority of the population of patients we see, I still believe a multimodal approach yields the greatest results in short and long-term outcomes but I am interested to see if future studies find evidence in targeting adjacent joints for patients who suffer from low back pain.

Griswold, D. et al. (2019). A randomized clinical trial comparing non-thrust manipulation with segmental and distal dry needling on pain, disability, and rate of recovery for patients with non-specific low back pain. *Journal of Manual and Manipulative Therapy*. DOI: 10.1080/10669817.2019.1574389.

Review Submitted: Casey B Moler

Objective: Comparing two manual therapy techniques, non-manipulative dry needling (both local and distal) and a semi-standardized non-thrust manipulation applied to the symptomatic lumbar level, on pain and disability for patients with NSLBP.

Methods: 65 patients with NSLBP >6 weeks in duration were randomized into either the NTM or DN group to be treated for 3 weeks for a total of 6 sessions. Inclusion criteria was limited to duration of symptoms, c/c of LBP that was reproducible, ODI>20%, and age (18-70 y.o.) Exclusion criteria were as followed: inability to reproduce sx's with PAIVM and palpation of paraspinals during examination of the lumbar spine, pain <2/10 on a 24 hour average, or red flag conditions that indicate systemic, neurological or conditions non-musculoskeletal in nature. DN intervention was provided segmentally to the involved lumbar spinal level as well as to the segment above and below followed by distal points following peripheral nerve distributions. The non-thrust manipulation group received 3 bouts of 45 seconds with 45 seconds between applied with a grade and technique left up to discretion of the treating physical therapist (2 total participating physical therapist). Primary outcomes measured were ODI, PSFS, NPRS, and PPT which were filled out every 2 visits. Each patient at discharge provided their perceived recovery.

Results: Both groups achieved both clinically and statistically meaningful changes in pain and disability (ODI) at each follow up. There was no between group differences in any of the outcome measures looked at in this study.

Conclusion: The current study identified that DN and NTM produced comparable outcomes, revealing between-group effects were neither clinically nor statistically significant.

Commentary: According to the authors, this study is the first to compare non-thrust manipulation and dry needling to local and distal sites to those with chronic non-specific low back pain. The authors wanted to investigate the effects of DN beyond the MTrP model and explore the effects of DN without manipulation on pain and disability in patients with non-specific low back pain. The dry needling intervention in this study was not targeted to elicit a local twitch response at any segment both locally or at distal sites. Although the between groups were not found to be statistically different the DN group did report greater improvements on the ODI, NPRS, and PSFS. Although, initial baseline levels were slightly higher in the DN intervention group. It is also important to note that both intervention groups received a home exercise program that was instructed to be performed daily (with >80% compliance rate) involving spinal movement and basic stabilization exercises which may have contributed to the effect in improvements. Limitations such as no control, limited inclusion/exclusion criteria, as well as lack of ability to consider patient-therapist interaction and placebo effect all play a role in the interpretation of this data. That being said, the results do not provide definitive data on which type of patients with NSLBP may benefit from one manual therapy technique over the other but having evidence that both were effective conservative treatments for patients with low back pain should not be negated. I would argue that from a risk/reward stand point of DN over a simple NTM of the involved lumbar segment seems less invasive, cost effective and more clinically applicable as a clinician who does not provide dry needling services. However, I also believe this information suggests that needle manipulation to achieve a LTR may not be necessary to see significant improvements in pain and disability in this patient population. There is some evidence that exhaustive LTR (local twitch response) needling may lead to increased inflammation and post-treatment soreness. Therefore utilization of DN without pistoning or rotation may be more appropriate for some patients with lumbar myofascial pain either as a treatment plan or as a treatment trial prior to the traditional dry needling with manipulation.