

## Monthly Literature Review, September 2017

### **The Effectiveness of Neural Mobilization for Neuromusculoskeletal Conditions: A Systematic Review and Meta-Analysis.** Basson A, Benita O, Ellis R, et al. *JOSPT*. Vol 47, Number 9, Sept 2017.

Review Submitted by: J. Pretlow PT, DPT, OCS

**Objective:** To assess the effectiveness of neural mobilization (NM) for neuromusculoskeletal conditions, as measured by outcomes related to pain, disability, and function.

**Methods:** Nine databases were searched for randomized clinical trials, published in English, evaluating the effect of NM in participants over 18 years old with neuromusculoskeletal conditions indicative of neural tissue dysfunction as inclusion criteria, date ranges of Jan 1980 to April 2016. Neural mobilization as an intervention included active exercises or passive techniques directed to the nervous system (eg, sliding and tensioning techniques) or to surrounding structures (eg, cervical lateral glide or lumbar foraminal opening techniques).

**Results:** 40 studies were reviewed, with 19 included in a meta-analysis for carpal tunnel syndrome (CTS), nerve-related low back pain (N-LBP), and nerve-related neck and arm pain (N-NAP). The meta-analysis revealed that NM (slump and SLR mobilization) had a significant effect on both pain and disability in participants with N-LBP when compared to exercises or to exercise and lumbar mobilization (pain: intensity [0-10]: mean difference, -1.78; 95% CI: -2.55, -1.01;  $P < .001$ ; Oswestry Disability Questionnaire [0-50]: mean difference, -9.52; 95% CI: -10.81, -8.23;  $P < .001$ ). Four studies evaluated cervical lateral glide techniques for treating N-NAP, with all reporting a significant improvement in pain for the groups receiving NM (pain intensity: mean difference, -1.89; 95% CI: -3.14, -0.64;  $P < .001$ ). Four studies used sliding and tensioning exercises to treat N-NAP resulting in significant improvements in pain ( $P < .001$ ) when compared to interferential therapy, traction, and exercises and improvements in pain ( $P < .05$ ) compared to exercise and ergonomic advice. Neural mobilization for CTS was not found to have a significant impact on the outcomes of pain and disability.

**Conclusion:** This review concluded that cervical lateral glide mobilization improves pain in patients with N-NAP, and slump and SLR mobilization improve pain and disability in patients with N-LBP.

**Commentary:** Although slump and SLR mobilization were found to have a significant effect on decreasing pain and disability in patients with N-LBP, it is worth noting that 8 of the 11 studies included in the meta-analysis had a high bias ranking. Also of note, treatment duration varied from 2 weeks to 6 weeks, without long term follow up, and sample sizes were relatively small. This systematic review found that neural mobilization, specifically lateral cervical glides, can be an effective intervention to decrease pain in patients with N-NAP. The three studies included in the meta-analysis all had a low bias ranking. Of these three studies, treatment duration varied from 1 session to 8 weeks. Sample sizes were generally small. Lateral cervical glides were found to be more effective when compared to a wait-list, ultrasound, and advice only. It would be helpful if future studies compared NM to other manual therapy techniques. The authors do make a good point about the need for specific terminology. Some of the studies state whether nerve "sliding" techniques or nerve "tensioning" techniques were used, and others use the term nerve "gliding". The authors recommend abandoning the term nerve gliding exercises for the term "neuodynamic techniques" to reference mobilizing the nerve or its surrounding structures. My takeaway from this review: Utilizing slump, SLR mobilization, and lateral cervical glides can be an effective intervention for decreasing pain. Due to the wide range of study methods and interventions compared, I recommend taking a closer look at the individual studies to inform your decision-making regarding specific patients.

**Steuri R, Sattelmayer M, Elsig S, et al. Effectiveness of conservative interventions including exercise, manual therapy and medical management in adults with shoulder impingement: a systematic review and meta-analysis of RCTs. *Br J Sports Med* 2017;51:1340-1347.**

**Review Submitted By:** Tyler France

**Objective:** To investigate the effectiveness of conservative interventions for pain, function, and range of motion in adults with shoulder impingement

**Methods:** Six databases were searched for full-text RCTs published before January 2017. Trials including patients with impingement diagnosed with a minimal set of diagnostic criteria and any kind of conservative interventions were included.

**Results:** Ultimately, 200 articles were selected for analysis. For pain, exercise was the most effective intervention (SMD: -0.94, 95% CI -1.69 to -0.19). Specific exercise was favorable to general exercise (SMD: -0.65, 95% CI -1.04 to -0.26) and exercise combined with manual therapy was preferable to exercise alone (SMD: -0.32, 95% CI -0.62 to -0.01), but only at short term follow-ups.

**Conclusions:** Exercise should be included as part of a conservative rehabilitation program for patients with shoulder impingement in order to reduce pain and improve function and range of motion. Tape, shockwave therapy, manual therapy, and laser can also be incorporated into these programs.

**Commentary:** The results of this review are largely in line with those of similar systematic reviews and meta-analyses looking at interventions for shoulder impingement. However, this study looks more strictly at the RCTs it analyzed, calling the overall level of evidence low, whereas previous studies stated that the evidence was of moderate, or even high-quality. The review found that use of NSAIDs and corticosteroid injections were also effective in managing these patients, but these interventions were not compared to exercise in any of the studies. In contrast to previous studies, this review failed to find sufficient evidence to prove that exercise is as effective as surgery. When treating these patients, a multi-modal approach including exercise to specifically target the identified impairments, manual therapy, taping, and modalities would likely be the most effective.

**Do Self-Efficacy, Body Mass Index, Duration Of Onset And Pain Intensity Determine Performance On Selected Physical Tasks In Individuals With Unilateral Knee Osteoarthritis?. Adegoke, B.O.A. et al. Musculoskelet Sci Pract. 2017 Dec; 32: 1-6. Web. [Epub ahead of print]**

Review submitted by Katie Long, PT, DPT

**Objective:** To assess the effects of self-efficacy and pain intensity scores in patients with knee OA and the relationship to their scores on three functional physical performance tests (stair test, timed up-and-go test, and 20-m walk test).

**Methods:** Cross-sectional study of 51 patients (22M, 29F) with unilateral knee OA. Inclusion criteria: clinical presentation of knee pain, >50 years old, knee stiffness, crepitis, bony tenderness and enlargement. Exclusion criteria: patients who had undergone surgical correction, knee replacement, hip or skeletal arthritis, or other skeletal problem of the back, hip or ankle. Pain intensity was assessed using the Box Numerical Pain Scale (BNPS); self-efficacy was assessed using the Arthritis Self-Efficacy Scale; function was assessed utilizing three functional tests (Stair test, Timed Up-and-Go, and 20-m Walk test).

**Results:** The functional performance tests (20MWT, TUG, SST) had significant direct correlational relationships between each other and with present pain intensity (PPI) scores. Pain Self-efficacy (PSE) and Function Self-efficacy (FSE) both had significant indirect correlations with PPI. There was a significant direct correlation between the PSE and the FSE. After controlling for the variables of age, BMI and time since onset of OA, the PSE and FSE relationship remained significant with increased strength of relationship; however, the correlations between FSE and performance measures and PPI remained significant but weaker.

**Conclusions:** Previous literature suggests that improving a patient's pain self-efficacy helps reduce reported pain intensity. However, results of this study suggest that pain intensity, rather than pain self-efficacy, was more significantly predictive of patients' performances on physical function tests. Therefore, the authors suggest intervention strategies targeted at reducing the patient's pain in order to promote increased success in functional tasks.

**Commentary:** The current article discusses the relationship between present pain intensity and success on functional performance tests. As opposed to previous articles implying that targeting a patient's pain self-efficacy will affect their pain intensity, the present article suggests that interventions aimed at reducing a patient's pain level may be necessary in order to achieve improved functional performance and clinical outcome. As this was a cross-sectional study, causative relationships cannot be made, and the authors recommend further examination of these relationships in a longitudinal study for further clinical relevance.

**Citation:**

Dickens J, Rue JP, Cameron K, Tokish J, Pec K, et al. Successful return to sport after arthroscopic shoulder stabilization versus nonoperative management in contact athletes with anterior shoulder instability. *AJSM*, 2017; 45(11): 2540-2546.

**Review submitted by:**

Jennifer M. Boyle

**Objective:**

**Primary:** To examine the likelihood of return to sport and recurrent instability based on the type of treatment (nonoperative management vs. surgical stabilization) among prospective cohort of contact and collision athletes in the season after the index in-season anterior instability event.

**Secondary:** To determine the effect of a single instability event vs recurrent events during the index season on the ability to successfully return to play in the following season.

**Methods:**

A prospective multicenter observational study performed by following 39 NCAA athletes that endured a contact injury resulting in instability. Sports included are as follows: basketball, soccer, lacrosse, rugby, boxing, baseball, football, martial arts and wrestling. Baseline data collected: sport played, previous episodes of instability, degree of instability and treatment method. One possible treatment method was taking a nonoperative approach that included a standardized accelerated rehabilitation program consisting of low-weight high-repetition scapular and RTC stabilization and strengthening until painless, symmetrical range of motion was achieved. The other treatment option was surgical stabilization arthroscopically with a standardized postoperative rehabilitation protocol with RTS granted no sooner than 6 months. Subjects were followed in their subsequent seasons to observe if the athlete was successful in RTS and if they had recurrent instability events.

**Results:**

39 out of 45 NCAA athletes who sustained an anterior shoulder instability event were followed during subsequent season to determine ability to RTS and reoccurrence. Out of the 10 athletes that underwent nonoperative treatment 30% of athletes' experienced recurrent injury in the index season and 60% experienced recurrent instability in the following season. Out of the 29 athletes that underwent surgical intervention 90% were able to RTS in the following season and not experience a recurrent instability event. 1 athlete experienced a recurrent instability event. 2 athletes were cut from the team. Athletes are 5.8 times more likely to compete the subsequent season without recurrent instability with surgical intervention in comparison to the nonoperative treatment. In addition, while looking at athletes that had numerous instability events during the index season, the athletes that chose surgical intervention were 9.5 times more likely to RTS

when compared to those who selected nonoperative treatment. No notable difference between athletes sustaining subluxation vs. dislocation.

### **Conclusions:**

Contact and collision athletes who endure in-season anterior shoulder instability are significantly more likely to return to sport without recurrent instability episodes in succeeding seasons if they choose to partake in surgical repair in the off season as opposed to nonoperative treatment.

### **Commentary:**

While looking at this study it is easy to understand its ability to be implemented into clinical practice. Shoulder instability treatment is a topic in which the choice between nonoperative and surgical intervention is debatable. After this study was performed there was a more definitive answer that surgical intervention is more appropriate in comparison to conservative intervention. This study has made it clear that the rate of reoccurrence is decreased significantly if the athlete partakes in a surgical intervention. This information is useful especially while treating a patient with GH instability that wants to return to sport in subsequent seasons. In general, I like to think we as physical therapists can help patients prolong or avoid surgeries but we do have limitations. This is one situation that physical therapy may not be in the patient's best interest while trying to get them to return to sport and decrease instability events.

**General Exercise Does Not Improve Long-Term Pain and Disability in Individuals With Whiplash-Associated Disorders: A Systematic Review. Griffin A, Leaver A, Moloney N. J Orthop Sports Phys Ther 2017;47(7):472–480. Epub 16 Jun 2017.**

**Review Submitted by Sarah Bosserman**

**Objective:** To determine whether general exercise is effective in reducing pain and disability in people with WAD (whiplash-associated disorders).

**Methods:** Eight electronic databases were searched from January 1990 to May 2015. Randomized controlled trials published in peer-reviewed journals were selected. Only studies that investigated a population with WAD grades I to III and utilized general exercise as an intervention for WAD were included. General exercise was described as “any non-specific, structured, and repetitive bodily movement incorporating multiple muscle groups and usually involving elevation of heart rate” (i.e. cycling, running, lifting, walking, and swimming). All 3 trials received a score of 8 out of 10 on the PEDro scale.

**Results:** In total, 3 articles were eligible for inclusion based on the criteria. One study found a small benefit in favor of general exercise combined with advice for pain outcomes at medium term (12

weeks) follow up (SMD -0.46; 95% CI -0.81, -0.12) compared with advice alone. The studies comparing general exercise alone with advice and physical therapy care with that of a general practitioner reported no significant difference in pain outcomes at medium-term follow up. None of the studies found significant differences between treatments and the control at long-term (52 weeks) follow up. The study comparing physical therapy with advice from a general practitioner reported a small to moderate, statistically significant benefit in favor of general exercise combined with advice for disability outcomes at medium- (SMD -0.50; 95% CI -0.85, -0.15) and long-term follow up (SMD -0.39; 95% CI -0.74, -0.03). However, the author's concluded that these differences were unlikely to be of clinical significance.

**Conclusions:** This systematic review concluded that comprehensive exercise programs were not more effective than brief interventions, including advice, for those with acute and chronic WAD in the medium term. There was only a small benefit on disability in the longer term, that was likely not clinically meaningful.

**Commentary:** Although only three studies were included, this review helped to highlight the complex nature of WAD and the need for further investigation of both patient selection and treatment dosage/selection. As the author's pointed out, none of the articles reviewed directly compared general exercise alone to a control, making it impossible to conclude if exercise as a stand-alone treatment would be more effective than advice or no intervention. Furthermore, only one of the studies had a way of measuring intensity of the exercise and the specific interventions were not listed, just generalized to a combination of "motor control, whole-body functional activities, balance, and aerobic exercise", with two of the trials including some form of manual therapy. The diversity of treatments that may have been used also make comparison between studies more difficult. A question worth further investigation would be the effect of specific exercise versus general exercise in the treatment of WAD due to the highly variable presentation of this population.

One of the challenges for physical therapists in treatment of patients with WAD is deciding who needs structured intervention and then deciding the appropriate dosage. Studies have shown greater pressure pain sensitivity following exercise in some with chronic WAD when compared to age-matched controls (Van Oosterwijck J et al 2012), which may help explain the variability in response these patients may have to exercise. This review points out the difficulty of deciding effective exercise intervention (intensity high enough for an analgesic response, but not to point of exacerbating pain hypersensitivity) as well as understanding the patient's biopsychosocial factors to identify those who may be at higher risk for a poor outcome. A recent study (Clark J et al 2017) found that psychological factors (somatization and poor self-expectation of recovery) was an indicator of altered central pain modulation in those with chronic pain (including WAD), which points the necessity of a multidisciplinary approach and communication between healthcare providers in the treatment of these patients.