Upper Extremity

This page only includes articles published in the last 5 years.

Shoulder

Rotator cuff (RC) and associated disorders (e.g., impingement, subacromial pain)

- One 2016 meta-anlysis[1] reported that scapular-focused approaches (SFA) provided benefit over generalized approaches up to 6 weeks following treatment. Although these early changes in pain were statistically significant, they were not clinically significant; changes in disability were statistically and clinically significant the only study that reported data beyond 6 weeks suggested the comparative benefit was no longer apparent at 3 months. Findings relating to the effect of SFA with regards to scapula position/movement were unclear and current evidence is conflicting.
- For **non-calcific RC tendinitis**, a 2016 review[2] reported evidence from a randomized controlled trial (RCT) that found dietary advice combined with acupuncture was superior to supervised passive, active-assisted, and active range of motion (ROM) exercises combined with soft tissue and manual therapy (MT) for the duration of ≥ 6 weeks and at follow-up. Results were statistically and clinically significant for pain and disability. The study also showed statistically and clinically significant increases in patients' perceived improvements. A detailed description of the soft tissue and MT was not provided by the single study. For **nonspecific shoulder pain (SP)**, studies showed minor benefits with multimodal PT programs compared to wait list control or guideline-based usual care performed by general practitioners. The review also reported multimodal care may not be superior to placebo interventions for the treatment of **subacromial impingement syndrome (SIS)**. However, when comparing SIS of variable durations, there were minor changes that may lead to improvements in recovery and pain when compared with corticosteroid injections.
- Another 2016 review[3] of the evidence for the effectiveness of PT modalities for **subacromial pain** found that specific exercises to address muscle flexibility and strengthening the shoulder/scapular muscles were as effective as arthroscopic surgery in all phases of treatment. MT added to exercise was shown to optimize pain and disability outcomes in this population. Low-level laser, pulsed electromagnetic field, ultrasound and taping were not shown to be effective.
- A 2016 Cochrane review[4] evaluated electrotherapy modalities. For **calcific tendinitis**, the authors found low-quality evidence to suggest ultrasound may have benefit over placebo in the short term. For **RC**, low-level laser may have benefit over placebo, but may not when combined with other PT interventions. Pulsed electromagnetic field may not provide clinically meaningful benefit over placebo or ultrasound, and also may not when combined with other PT. TENS may or may not be superior to placebo. Uncertainty still exists for whether any electrotherapy modality provides benefit over other active treatments.
- Another 2016 Cochrane review[5] evaluated MT and exercise for the treatment of **RC**. They found high-quality evidence that when comparing MT and exercise to placebo, there was no clinically important benefit. Low-quality evidence showed the combination may be similar to glucocorticoid injection and arthroscopic subacromial decompression.

A small clinical trial comparing mobilization-with-movement and a sham technique for the treatment of **SIS** found no significant differences between the groups for any outcome (pain, function, ROM).[6]

A 2015 review was performed to evaluate the efficacy of MT, consisting mostly manipulation and mobilization, for the treatment of **RC tendinopathy**.[7] Although it could not be determined whether or

not overall results were clinically important, variable quality evidence showed statistically significant improvements favoring MT. The authors concluded that low-to-moderate-level evidence suggests MT used either alone or in combination with other interventions (such as massage, electrotherapy or education) improves pain. Low-level evidence suggests adding MT to an exercise program significantly reduces pain as well. Another 2015 review assessing MT for the management of musculoskeletal disorders of the upper extremity found favorable evidence supporting the effectiveness for treating **SP**.[8]

For the treatment of **SIS and other soft tissue injuries**, a 2015 review examined the effectiveness of exercise therapy compared to placebo or sham, other or no intervention.[9] All exercise programs in the included studies were directed toward strengthening the RC; 3 studies included strengthening scapular musculature and 2 incorporated stretching. Evidence was limited; however, trials with low risk of bias indicated home-based strengthening exercises for the RC and scapular muscles provided improvements in pain and disability for patients with varied duration SIS. Additionally, supervised strengthening and stretching exercises showed comparable short-term outcomes with a single corticosteroid injection or a multimodal care program for the management of low-grade, varied-duration SP. With persistent symptoms, home-based and supervised strengthening exercises provided similar outcomes to surgery and post-operative rehab.

A 2015 systematic review synthesized the evidence on the effectiveness of passive physical modalities for the treatment of shoulder pain.[10] Ultrasound and interferential current therapy were not found to be more effective than placebo for **SP**. Similarly, the authors concluded that for patients with **SIS**, most passive modalities do not provide a benefit. Some evidence suggested low-level laser therapy is more effective than placebo or ultrasound at a 2-week follow-up. Pretensioned tape and shock-wave therapy were not more effective than placebo. For **calcific RC**, statistically and clinically significant reductions in pain and disability were found with shock-wave therapy when compared to a sham.

Adhesive Capsulitis (AC)

A small RCT comparing axillary ultrasound, laser and postisometric facilitation technique with standard care for the treatment of AC reported that the combination program produced the greatest improvements in pain and ROM.[11]

A 2014 Cochrane review[12] assessed the evidence of the benefits and harms of MT and exercise alone or combined for the treatment of AC. Results showed:

- High-quality evidence that MT and exercise combined do not improve pain or function more than sham ultrasound following arthrographic joint distension. However, benefits of this combination may be increased with patient-reported treatment success and active ROM.
- Moderate-quality evidence that MT and exercise combined “probably improves pain and function less than glucocorticoid injection up to 7 weeks, and probably does not result in more adverse events.”
- Low-quality evidence that:
  - combining MT, exercise and electrotherapy (such as ultrasound) “may not improve pain or function more than glucocorticoid injection or placebo injection into the shoulder.”
  - combining MT, exercise, electrotherapy and glucocorticoid injection may not be superior to glucocorticoid injection alone.
  - combining MT, exercise, electrotherapy and an oral NSAID may not be superior to an oral NSAID alone.

Other upper extremity
A 2016 systematic review[13] investigated the effectiveness of multimodal care for the treatment of disorders of the elbow, forearm, wrist or hand. In general, evidence was limited. For persistent lateral epicondylitis, multimodal care may be beneficial with common components of education, exercise (strengthening, stretching, occupational), MT (manipulation) and massage. For the treatment of carpal tunnel syndrome, multimodal care consisting of NSAIDS, education, exercise, stretching, splinting, ultrasound, home/workplace modifications was not as effective as decompression surgery.

A 2015 review evaluated the effectiveness of exercise compared to placebo/sham, other or no intervention for the treatment of musculoskeletal disorders or injuries of the elbow, forearm, wrist or hand.[14] Limited evidence was found regarding persistent (>3 months) lateral epicondylitis and hand pain. For lateral epicondylitis, home-based concentric or eccentric strengthening exercises were more effective for pain reduction than "wait and see." However, combining strengthening exercises with stretching and advice provided no added benefit when compared to stretching and advice alone. Further, clinic-based strengthening and static stretching exercises were found to be more effective than the same exercises performed at home, suggesting uncertainty about the value of stretching vs strengthening. For hand pain, combining supervised strength training with advice to continue normal physical activity did not offer added benefit. No other studies with a low risk of bias concerning exercise in the management of other disorders were found.

A 2014 systematic review and meta-analysis found that spinal manipulation "appears to be no better than or inferior to any other intervention" in the management of upper limb pain.[15] It was cautioned that evidence was very low and more research is necessary, especially high-quality RCTs.

A 2013 systematic review[16] concluded:

- Fair evidence (Grade B) for manipulative and multimodal therapy (MMT) alone or in combination with multimodal treatments for:
  - lateral epicondylopathy in the short term (≤3-6 months)
  - carpal tunnel syndrome in the short term
  - TMJ disorders in the short term
- Insufficient evidence (Grade I) for MMT and multimodal treatment for other wrist, hand and finger disorders in the short term
- Multimodal treatments include manipulation, mobilization, exercise, strengthening and stretching, soft tissue therapies, mobilization or manipulation instruments, proprioceptive neuromuscular facilitation, splinting or orthoses, electrical and mechanical modalities and other myofascial, functional and soft tissue techniques

Dry Needling
A 2013 systematic review and meta-analysis was performed to assess immediate and long-term effectiveness of dry needling (DN) for the management of myofascial pain syndrome in the upper quarter.[17] The authors cautioned that there were a limited number of studies performed with many exhibiting methodological flaws. High heterogeneity occurred in the results of the meta-analysis and prompted some uncertainty in the interpretation. Based on the best quality evidence found, they recommend DN for immediate reduction of pain and cautiously recommend DN for reduction of pain at 4 weeks. However, lidocaine injections may be superior to DN for reducing pain immediately and at 4 weeks post-treatment.

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