

**Manual therapy in the management of tendinopathy:
a summary of recent relevant research
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Key messages:

- Tendinopathy is generally accepted to be the result of tendon derangement and adverse mechanical loading, in the absence of inflammation (Narici et al, 2008; Riley, 2008).
- Osteopaths and other manual therapists may treat a multitude of common tendinopathies, often using manual therapy techniques (massage, mobilisation and manipulation), despite a paucity of high-quality research to support its use.
- For patients with rotator cuff tendinopathy, there is low-to moderate quality evidence supporting the use of manual therapy (MT) to reduce pain, but not to improve function.
- For patients with lateral knee or elbow 'tendinitis', there is mixed evidence to support the application of MT (specifically deep friction massage) to improve pain and function.
- The myriad locations and pathogenesis of tendinopathy, combined with the varied study designs and outcome measures to examine the efficacy of MT for tendinopathy, makes research problematic and firm conclusions difficult.
- Theoretical explanations support the use of MT with a rationale that fits the current understanding of tendinopathy (improved mechanical loading; application of mechanical stimulus for healing; improved microstructure reorganisation).
- Further high-quality research is needed comparing MT techniques against other modes of treatment in controlled trials.



CONTEXT

This article is designed to give a brief overview of predominantly manual therapy and osteopathic-relevant research, with references provided for further reading; it is not intended to be an exhaustive account of the literature.

Manual therapy in the management of tendinopathy

Tendinopathy is now widely understood to be a maladaptive response to mechanical loading, often linked to a degenerative process in the absence of inflammation (Joseph et al, 2012). Commonly affected areas include the Achilles, posterior tibialis, patellar, lateral elbow and rotator cuff tendons. The variation in locations, aetiology and pathogenesis of these tendinopathies can therefore make treatment decisions difficult and although **manual therapy** is one of many proposed conservative treatments (others including acupuncture, exercise prescription and electrotherapies e.g. Bisset et al, 2005), there appears to be little evidence to support its use. For this review, manual therapy is a conservative treatment approach consisting of a range of techniques that include manipulation (using thrust techniques), mobilisation (non-thrust manipulation), and massage.

This summary was based on existing published summaries of evidence from the Cochrane database, NICE guidelines and Clinical Knowledge Summaries (CKS). We included reviews if specific mention was made in the title to manual therapy (MT) in the management of tendinopathies. Excluded were reviews that considered other conservative treatments without reference to MT. Although it is acknowledged that osteopaths do not focus their treatment on the management of *conditions* and may use a range of techniques not considered to be MT (e.g. acupuncture and exercise therapy), the purpose of this summary is to consider only the use of MT in the management of any tendinopathy.

We reviewed 4 systematic reviews written between 2005 and 2015 to create this summary.

A recent systematic review and meta-analysis (Desjardins-Charbonneau et al, 2015) considered the **efficacy of MT for rotator cuff tendinopathy**. Specifically, the authors reviewed the overall efficacy of MT alone; MT compared to a placebo intervention; and MT along with, or compared to, alternative treatments (including exercise) across a range of outcome measures that included pain, function and range of movement (ROM).

Following a well-documented inclusion/exclusion criteria process, the total eligible papers reduced from 300 randomised controlled trials (RCTs) to 21 after full text review. Of these 21 papers, only 5 demonstrated a moderate to low risk of bias following scrutiny using the 'Cochrane risk of bias tool'.

Results from studies with similar comparisons or outcome measures were pooled into meta-analyses and when quantitative pooling was not possible, results were qualitatively synthesised, although little description of this qualitative synthesis is given. Summarised results from this review show:

- There is low-to-moderate evidence that overall, MT, either alone or in conjunction with other modalities, may be effective at reducing pain. This is based on a primary meta-analysis of pooled results from 10 RCTs, which demonstrated a statistically significant difference of 1.2 (95% CI: 0.8, 1.6) on a 10 cm visual analogue scale (VAS). The clinical significance of this is questionable however, as a previously reported minimal clinically important difference (MCID) sits at 1.4cm (Desjardins-Charbonneau et al, 2015).
- There is low-quality evidence to suggest that based on a meta-analysis of results from 5 RCTs (n = 226), adding MT to an exercise programme significantly decreases pain at four weeks, with a mean difference of 1.0 on a 10cm VAS (95% CI: 0.7, 1.4). Again, the authors argue that a small treatment effect may still nevertheless be clinically significant.
- Following qualitative analysis of 6 low-to moderate-quality RCTs, MT alone or added to an exercise programme may or may not improve function. Results are equivocal as treatment effects tended to be small, functional outcomes were rarely validated and results were only partially recorded.

These results are consistent with Clar et al's (2014) recently updated and extensive systematic review, which looked broadly at the effectiveness of manual therapy across a range of musculoskeletal (MSK) and non-MSK conditions. They concluded that there is moderate, favourable evidence to support MT when combined with exercise in the management of rotator cuff and soft tissue disorders of the shoulder. What is not clear however, is the degree to which these results consider tendinopathy as a particular and separate diagnosis.

An updated systematic review by Loew et al, (2014), assessed the available evidence for the benefits and harms of **deep transverse friction massage (DTFM) for treating lateral elbow or lateral knee tendinitis**. Specifically, the authors wished to compare DTFM against other active treatments (exercise and electrotherapies) and similarly to Desjardins-Charbonneau et al, (2015), outcomes included pain, function, ROM and quality of life measures.

Loew et al's (2014) extensive electronic literature search identified nearly 1000 RCTs or controlled clinical trials (CCTs) that compared DTFM with control or other active interventions for patients with elbow or knee tendinopathy, from which only 28 full text articles were assessed for eligibility. Disappointingly, only 2 papers met the inclusion criteria for a quantitative synthesis (meta-analysis) and both of these had a high risk of bias following review.

One study (n = 40) in a 'tennis elbow' population compared DTFM combined with therapeutic ultrasound and placebo ointment (n = 11) against therapeutic ultrasound and placebo ointment alone (n = 9) in addition to DTFM combined with phonophoresis (n = 10) against phonophoresis alone (n = 10). The second study (n = 17) compared DTFM combined with physical therapy against physical therapy alone in a lateral knee tendinitis population. Summarised results show:

- For patients with lateral epicondylgia (tendinitis, in this study), DTFM was uncertain to improve pain and function as measured by grip strength. Evidence was rated as very low quality.
- For patients with lateral knee tendinitis, DTFM was uncertain to improve pain or quality of life. Evidence was again rated as very low quality.

These results are limited by the small sample sizes in the RCTs and Loew et al (2014) concluded that there was insufficient evidence to determine the clinical effectiveness of DTFM in the management of lateral elbow or lateral knee tendinitis.

These findings generally support those of Clar et al (2014), who also conclude there is inconsistent although favourable evidence for the use of MT in addition to other treatments (placebo, phonophoresis, rest) for the management of lateral epicondylitis, although this favourability does not extend to the use of manipulation alone as a MT treatment for tennis elbow.

Joseph et al's (2012) qualitative systematic review considered the efficacy of **deep friction massage** (DFM) in the management of tendinopathy. Out of nearly 400 studies screened, Joseph et al (2012) identified only 9 for inclusion, which included 4 randomised comparison trials; 3 investigating Extensor Carpi Radialis Brevis (ECRB) tendinopathy and 1 investigating supraspinatus tendinopathy; 2 non-randomised comparison trials both investigating DFM for ECRB tendinopathy and 3 prospective cohort studies, 1 each for ECRB, supraspinatus and Achilles tendinopathy. Outcome measures included pain reduction over time, measures of improved functional return such as grip strength and patient-rated scales.

The considerable diversity of the patient populations and study designs precluded quantitative synthesis, although steps were taken to assess the quality of the studies using the PEDro scale; a physiotherapy electronic database that rates RCTs against 11 criteria (8 consider the internal validity of the RCTs and 3 items consider the statistical reporting), each requiring a 'yes' or 'no' answer. Trials scoring 11 (or close to) are therefore generally considered of particular interest. For their review, Joseph et al's included RCTs did not score higher than 7 using the PEDro criteria.

Summarised results show:

- Despite the variations in tendinopathies considered, assessment criteria and outcome measures used, the four randomised comparison studies support the use of DFM in the management of ECRB and supraspinatus tendinopathy, although its efficacy as an isolated treatment is not established.
- The two non-randomised comparison studies support the use of DFM in the management of ECRB tendinopathy when compared with other modalities (including physical therapy and therapeutic ultrasound) and when combined with a radial head manipulation.

- Despite using different measures to determine improvement, all three prospective cohort studies tentatively concluded that DFM potentially resulted in improved function and reduced pain.

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