

# **Collected Scientific Research Relating to the Use of Osteopathy with Shoulder pain and stiffness, excluding frozen shoulder/adhesive capsulitis**

## **Important:**

1) Osteopathy involves helping people's own self-healing abilities to work better, rather than focussing primarily on particular conditions.

2) Each person is different, and osteopathy treats them differently.

Therefore people respond to osteopathic treatment in different ways. Treatments that work for one person cannot be guaranteed to work for another person in the same way. The fact that there is scientific research supporting a treatment in a group of people does not mean that it will always work in the same way (which is probably true of all research).

A number of things make research into osteopathy challenging. These include the two aspects of osteopathy mentioned above, and also the lack of major commercial interests to provide funding in expectation of financial returns. At the same time, there is an emerging body of research demonstrating the usefulness of osteopathic treatment.

More research is being done all of the time. I am not aware of any research which shows that osteopathic treatment, delivered by a qualified osteopath, is ineffective in relation to this area. If you are aware of any studies that show that, please bring them to my attention.

Please note: there is room for debate about the classifications used for these studies. Please let John Smartt know if you believe that any of these classifications are incorrect.

# These studies are from peer-reviewed journals

Number of studies: 10

## Clinically and statistically significant results

Number of studies: 8

### Randomised controlled trials

Number of studies: 5

Cho Y, Do J, Jung S, Kwon O,, Jeon JY 2015 **Effects of a physical therapy program combined with manual lymphatic drainage on shoulder function, quality of life, lymphedema incidence, and pain in breast cancer patients with axillary web syndrome following axillary dissection.** Support Care Cancer Nov 5 <http://www.ncbi.nlm.nih.gov/pubmed/26542271>

"The aim of this study was to evaluate the effects of physical therapy (PT) combined with manual lymphatic drainage (MLD) on shoulder function, pain, lymphedema, visible cords, and quality of life (QOL) in breast cancer patients with axillary web syndrome (AWS)."

"METHODS:

In this prospective, randomized trial, 41 breast cancer patients with visible and palpable cords on the arm and axilla and a numeric rating scale (NRS) pain score of >3 were randomly assigned to PT (3 times/week for 4 weeks; n = 20) and PT combined with MLD (5 times/week for 4 weeks; PTMLD; n = 21) groups. MLD was performed by a physical therapist and the patients themselves during week 1 and weeks 2-4, respectively. Arm volume, shoulder function (muscular strength; active range of motion; and disabilities of the arm, shoulder, and hand [DASH]); QOL (European Organization for Research and Treatment of Cancer Core and Breast Cancer-Specific QOL questionnaires), and pain (NRS) were assessed at baseline and after 4 weeks of treatment.

RESULTS:

QOL including functional and symptom aspects, shoulder flexor strength, DASH, and NRS scores were significantly improved in both groups after the 4-week intervention ( $P < 0.05$ ). NRS score and arm volume were significantly lower in the PTMLD group than in the PT group ( $P < 0.05$ ). Lymphedema was observed in the PT (n = 6), but not PTMLD, group ( $P < 0.05$ ).

CONCLUSIONS: PT improves shoulder function, pain, and QOL in breast cancer patients with AWS and combined with MLD decreases arm lymphedema."

Moore SD, Laudner KG, McLoda TA, Shaffer MA 2011 **The immediate effects of muscle energy technique on posterior shoulder tightness: a randomized controlled trial.** J Orthop Sports Phys Ther Jun;41(6):400-7 <http://www.ncbi.nlm.nih.gov/pubmed/21471651>

"Randomized controlled trial.

OBJECTIVES:

To compare a muscle energy technique (MET) for the glenohumeral joint (GHJ) horizontal abductors and an MET for the GHJ external rotators to improve GHJ range of motion (ROM) in baseball players.

BACKGROUND:

Overhead athletes often exhibit loss of GHJ ROM in internal rotation, which has been associated with shoulder pathology. Current stretching protocols aimed at improving flexibility of

the posterior shoulder have resulted in inconsistent outcomes. Although utilization of MET has been hypothesized to lengthen tissue, there are limited empirical data describing the effectiveness of such stretches for treating posterior shoulder tightness.

#### METHODS:

Sixty-one Division I baseball players were randomly assigned to 1 of 3 groups: MET for the GHJ horizontal abductors (n = 19), MET for the GHJ external rotators (n = 22), and control (n = 20). We measured preintervention and postintervention GHJ horizontal adduction and internal rotation ROM, and conducted analyses of covariance, followed by Tukey honestly significant difference post hoc analysis for significant group-by-time interactions (P<.05).

#### RESULTS:

The group treated with the MET for the horizontal abductors had a significantly greater increase in GHJ horizontal adduction ROM postintervention (mean  $\pm$  SD,  $6.8^\circ \pm 10.5^\circ$ ) compared to the control group ( $-1.1^\circ \pm 6.8^\circ$ ) (P = .011) and a greater increase in internal rotation ROM postintervention ( $4.2^\circ \pm 5.3^\circ$ ) compared to the group treated with the MET for the external rotators ( $0.2^\circ \pm 6.3^\circ$ ) (P = .020) and the control group ( $-0.2^\circ \pm 4.0^\circ$ ) (P = .029). No significant differences among groups were found for any other variables (P>.05).

#### CONCLUSION:

A single application of an MET for the GHJ horizontal abductors provides immediate improvements in both GHJ horizontal adduction and internal rotation ROM in asymptomatic collegiate baseball players. Application of MET for the horizontal abductors may be useful to gain ROM in overhead athletes."

Bialoszewski D, Zaborowski G 2011 **Usefulness of manual therapy in the rehabilitation of patients with chronic rotator cuff injuries Preliminary report.** Ortop Traumatol Rehab *https://www.ncbi.nlm.nih.gov/pubmed/21393644*

#### "BACKGROUND:

Various manual therapy procedures are increasingly more often being used in the treatment of shoulder complex dysfunctions. The objective of the present study was to investigate whether manual therapy can improve the range of motion in the glenohumeral joint and alleviate pain in patients with chronic rotator cuff injuries

#### MATERIAL AND METHODS:

The participants were randomly assigned to an experimental group and a control group of 15 patients each. Both groups received a standard combination therapy involving TENS, ultrasound therapy and kinesiotherapy. Additionally, the experimental group took part in a treatment programme designed by the authors composed of selected elements of various manual therapy techniques. Outcome evaluation focused on changes in the range of motion in the glenohumeral joint and changes in pain intensity (VAS scale) during the performance of functional tests. The results were subjected to statistical analysis.

#### RESULTS:

More rapid and more significant pain reduction and more significant improvement in the range of motion of the glenohumeral joint across all movements tested were obtained in the experimental group.

#### CONCLUSION:

The inclusion of manual therapy in standard comprehensive physiotherapy applied in the rehabilitation of patients with chronic rotator cuff injuries of the glenohumeral joint significantly improves treatment effectiveness.."

Bergman GJ, Winters JC, Groenier KH, Meyboom-de JB, Postema K, van der Heijden GJ 2010 **Manipulative therapy in addition to usual care for patients with shoulder complaints: results of physical examination outcomes in a randomized controlled trial.** J Manipulative Physiol Ther *https://www.ncbi.nlm.nih.gov/pubmed/20170774*

#### "OBJECTIVE:

The purpose of this study was to examine the effect of manipulative therapy on the shoulder girdle, in addition to usual care provided by the general practitioner, on the outcomes of physical examination tests for the treatment of shoulder complaints.

#### METHODS:

This was a randomized controlled trial in a primary care setting in the Netherlands. A total of

150 participants were recruited from December 2000 until December 2002. All patients received usual care by the general practitioner. Usual care included one or more of the following depending on the needs of the patient: information/advice, oral analgesics or nonsteroidal antiinflammatory drugs, corticosteroid injections, exercises, and massage. In addition to usual care, the intervention group received manipulative therapy, up to 6 treatment sessions in a 12-week period. Twenty-four physical examination tests were done at baseline and after 6, 12, and 26 weeks. Factor analysis was done to reduce the number of outcome measures.

**RESULTS:**

The factor analysis resulted in 4 factors: "shoulder pain," "neck pain," "shoulder mobility," and "neck mobility." At 6 weeks, no significant differences between groups were found. At 12 weeks, the mean changes of all 4 factors favored the intervention group; the factors "shoulder pain" and "neck pain" reached statistical significance (95% confidence interval [CI], 0.1-2.1). At 26 weeks, differences in the factors "shoulder pain" (95% CI, 0.0-2.6), "shoulder mobility" (95% CI, 0.2-1.7), and "mobility neck" (95% CI, 0.2-1.3) statistically favored the intervention group.

**CONCLUSION:**

In this pragmatic study, manipulative therapy, in addition to usual care by the general practitioner, diminished severity of shoulder pain and neck pain and improved shoulder and neck mobility."

**Knebl JA, Shores JH, Gamber RG, Gray WT, Herron KM. 2002 Improving functional ability in the elderly via the Spencer technique, an osteopathic manipulative treatment: a randomized, controlled trial. J Am Osteopath Assoc Jul;102(7):387-96 <http://www.ncbi.nlm.nih.gov/pubmed/12138953>**

"Twenty-nine elderly patients with preexisting shoulder problems voluntarily enrolled as subjects in this study, which was undertaken to determine the efficacy of osteopathic manipulative treatment (OMT) in an elderly population to increase functional independence, increase range of motion (ROM) of the shoulder, and decrease pain associated with common shoulder problems. Each subject had chronic pain, decreased ROM, and/or decreased functional ability in the shoulder before entering the study. Subjects were randomly assigned to either a treatment (OMT) group or a control group for 14 weeks. Over the course of treatment, both groups had significantly increased ROM ( $P < .01$ ) and decreased perceived pain ( $P < .01$ ). All subjects continued on their preexisting course of therapy for any concurrent medical problems. After treatment, those subjects who had received OMT demonstrated continued improvement in their ROM, while ROM in the placebo group decreased."

Sonberg M, Mullinger B, Rajendran D 2010 **Can osteopathy help women with a history of hypothyroidism and musculoskeletal complaints? Outcome of a preliminary, prospective, open investigation** International Journal of Osteopathic Medicine Vol 13 (1) pages 11-16 <http://www.sciencedirect.com/science/article/pii/S1746068909000510>

**The study was a before-and-after study, with little or no external control.**

"Post-menopausal women on medication for hypothyroidism, diagnosed at least 3 years previously, and suffering from musculoskeletal pain were recruited. Each received three identical osteopathic treatment sessions, approximately 1 week apart. Pain intensity and pain interference with aspects of daily living were assessed by subjects before each session and at follow-up (4–6 weeks later), using visual analogue scales."

"The 18 subjects (mean age 57 years) had suffered pain for an average of 17 years; pain was often generalised, with the shoulders/upper limb and head/neck being the sites of greatest pain. There were statistically significant improvements in 'Pain intensity' score from baseline to follow-up ( $p \leq 0.001$ ; Wilcoxon test) and also in 'pain interference' score between baseline and all subsequent time points ( $p \leq 0.001$ )."

"This study provides preliminary evidence suggesting that osteopathic treatment may help alleviate musculoskeletal pain in post-menopausal women being pharmacologically treated for hypothyroidism."

Yu IY, Jung IG, Kang MH, Lee DK, Oh JS 2015 **Immediate effects of an end-range mobilization technique on shoulder range of motion and skin temperature in individuals with posterior shoulder tightness.** J Phys Ther Sci Jun;27(6):1723-5 <https://www.ncbi.nlm.nih.gov/pubmed/26180306>

"This study investigated the effects of an end-range mobilization technique on the range of motion of the glenohumeral internal rotation and the skin temperature of the shoulder in individuals with posterior shoulder tightness. [Subjects] Thirteen subjects with posterior shoulder tightness who had glenohumeral internal rotation deficit  $\geq 15^\circ$  participated. [Methods] All subjects underwent glenohumeral joint end-range mobilization intervention. The internal rotation range of motion of the glenohumeral joint was measured by a goniometer and the shoulder skin temperature was measured by a digital infrared thermographic imaging device before and immediately after the intervention. Paired t-tests were used to analyze the differences in these parameter pre and post-intervention. [Results] The glenohumeral internal rotation range of motion and skin temperature of the posterolateral shoulder increased significantly post-intervention. [Conclusion] The end-range mobilization technique is effective for increasing the glenohumeral internal rotation range of motion and skin temperature of the shoulder in individuals with posterior shoulder tightness."

## Case series

Number of studies: 1

Hidalgo-Lozano A, Fernández-de-las-Peñas C, Díaz-Rodríguez L, González-Iglesias J, Palacios-Ceña D, Arroyo-Morales M 2011 **Changes in pain and pressure pain sensitivity after manual treatment of active trigger points in patients with unilateral shoulder impingement: a case series.** *Journal of Bodywork and Movement Therapies* Oct;15(4):399-404 [http://www.researchgate.net/publication/51670726\\_Changes\\_in\\_pain\\_and\\_pressure\\_pain\\_sensitivity\\_after\\_manual\\_treatment\\_of\\_active\\_trigger\\_points\\_in\\_patients\\_with\\_unilateral\\_shoulders\\_impingement\\_A\\_case\\_series](http://www.researchgate.net/publication/51670726_Changes_in_pain_and_pressure_pain_sensitivity_after_manual_treatment_of_active_trigger_points_in_patients_with_unilateral_shoulders_impingement_A_case_series)

net/publication/51670726\_Changes\_in\_pain\_and\_pressure\_pain\_sensitivity\_after\_manual\_treatment\_of\_active\_trigger\_points\_in\_patients\_with\_unilateral\_shoulders\_impingement\_A\_case\_series

"The aim of this case series was to investigate changes in pain and pressure pain sensitivity after manual treatment of active trigger points (TrPs) in the shoulder muscles in individuals with unilateral shoulder impingement. Twelve patients (7 men, 5 women, age:  $25 \pm 9$  years) diagnosed with unilateral shoulder impingement attended 4 sessions for 2 weeks (2 sessions/week). They received TrP pressure release and neuromuscular interventions over each active TrP that was found. The outcome measures were pain during arm elevation (visual analogue scale, VAS) and pressure pain thresholds (PPT) over levator scapulae, supraspinatus, infraspinatus, pectoralis major, and tibialis anterior muscles. Pain was captured pre-intervention and at a 1-month follow-up, whereas PPT were assessed pre- and post-treatment, and at a 1-month follow-up. Patients experienced a significant ( $P < 0.001$ ) reduction in pain after treatment (mean  $\pm$  SD:  $1.3 \pm 0.5$ ) with a large effect size ( $d > 1$ ). In addition, patients also experienced a significant increase in PPT immediate after the treatment ( $P < 0.05$ ) and one month after discharge ( $P < 0.01$ ), with effect sizes ranging from moderate ( $d = 0.4$ ) to large ( $d > 1$ ). A significant negative association ( $r(s) = -0.525$ ;  $P = 0.049$ ) between the increase in PPT over the supraspinatus muscle and the decrease in pain was found: the greater the decrease in pain, the greater the increase in PPT. This case series has shown that manual treatment of active muscle TrPs can help to reduce shoulder pain and pressure sensitivity in shoulder impingement. Current findings suggest that active TrPs in the shoulder musculature may contribute directly to shoulder complaint and sensitization in patients with shoulder impingement syndrome, although future randomized controlled trials are required."

## Mixed results (significant for some outcomes, not others)

Number of studies: 2

Ho CY, Sole G, Munn J 2009 **The effectiveness of manual therapy in the management of musculoskeletal disorders of the shoulder: a systematic review.** *Manual Ther* <https://www.ncbi.nlm.nih.gov/pubmed/19467911>

**There has been a considerable amount of research into shoulder conditions since this review was undertaken.**

"A systematic review of randomised controlled trials (RCTs) was conducted to determine the effectiveness of manual therapy (MT) techniques for the management of musculoskeletal disorders of the shoulder. Seven electronic databases were searched up to January 2007, and reference lists of retrieved articles and relevant MT journals were screened. Fourteen RCTs met the inclusion criteria and their methodological qualities were assessed using the PEDro scale. Results were analyzed within diagnostic subgroups (adhesive capsulitis (AC), shoulder impingement syndrome [SIS], non-specific shoulder pain/dysfunction) and a qualitative analysis using levels of evidence to define treatment effectiveness was applied. For SIS, there was no clear evidence to suggest additional benefits of MT to other interventions. MT was not shown to be more effective than other conservative interventions for AC, however, massage and Mobilizations-with-Movement may be useful in comparison to no treatment for short-term outcomes for shoulder dysfunction."

Bennell K, Wee E, Coburn S, Green S, Harris A, Staples M, Forbes A, Buchbinder R 2010  
**Efficacy of standardised manual therapy and home exercise programme for chronic rotator cuff disease: randomised placebo controlled trial.** *BMJ* <https://www.bmj.com/content/340/bmj.c2756>

**Objective** To investigate the efficacy of a programme of manual therapy and exercise treatment compared with placebo treatment delivered by physiotherapists for people with chronic rotator cuff disease.

**Design** Randomised, participant and single assessor blinded, placebo controlled trial.

**Setting** Metropolitan region of Melbourne, Victoria, Australia.

**Participants** 120 participants with chronic (>3 months) rotator cuff disease recruited through medical practitioners and from the community.

**Interventions** The active treatment comprised a manual therapy and home exercise programme; the placebo treatment comprised inactive ultrasound therapy and application of an inert gel. Participants in both groups received 10 sessions of individual standardised treatment over 10 weeks. For the following 12 weeks, the active group continued the home exercise programme and the placebo group received no treatment.

**Main outcome measures** The primary outcomes were pain and function measured by the shoulder pain and disability index, average pain on movement measured on an 11 point numerical rating scale, and participants' perceived global rating of overall change.

**Results** 112 (93%) participants completed the 22 week trial. At 11 weeks no difference was found between groups for change in shoulder pain and disability index (3.6, 95% confidence interval -2.1 to 9.4) or change in pain (0.7, -0.1 to 1.5); both groups showed significant improvements. More participants in the active group reported a successful outcome (defined as "much better"), although the difference was not statistically significant: 42% (24/57) of active participants and 30% (18/61) of placebo participants (relative risk 1.43, 0.87 to 2.34). The active group showed a significantly greater improvement in shoulder pain and disability index than did the placebo group at 22 weeks (between group difference 7.1, 0.3 to 13.9), although no significant difference existed between groups for change in pain (0.9, -0.03 to 1.7) or for the percentage of participants reporting a successful treatment outcome (relative risk 1.39, 0.94 to 2.03). Several secondary outcomes favoured the active group, including shoulder pain and disability index function score, muscle strength, interference with activity, and quality of life.

**Conclusion** A standardised programme of manual therapy and home exercise did not confer additional immediate benefits for pain and function compared with a realistic placebo treatment that controlled for therapists' contact in middle aged to older adults with chronic rotator cuff disease. However, greater improvements were apparent at follow-up, particularly in shoulder function and strength, suggesting that benefits with active treatment take longer to manifest."