

# Collected Scientific Research Relating to the Use of Osteopathy with Neck pain

## 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:  
20

## Clinically and statistically significant results

Number  
of studies:  
19

### Systematic reviews

Number of studies: 1

Walser RF, Meserve BB, Boucher TR 2009 **The effectiveness of thoracic spine manipulation for the management of musculoskeletal conditions: a systematic review and meta-analysis of randomized clinical trials.** *J Man Manip Ther* 17(4):237-46 <http://www.maneyonline.com/doi/abs/10.1179/106698109791352085>

"Thoracic spine manipulation (TSM) is an intervention practiced by different professions, and recently an incursion of research using TSM has been published. The purpose of this review was to examine the effectiveness of TSM for the management of musculoskeletal conditions and the quality of trials that included TSM techniques. A comprehensive search of online databases was performed, and first authors of studies identified were contacted. Thirteen randomized clinical trials were included in the final review. The methodological quality of all studies was assessed using the 10-point PEDro scale. Seven of the 13 studies were of high quality. Three studies looked at TSM for treatment of shoulder conditions; however, there is limited evidence to support the use of TSM for shoulder conditions. Nine studies used TSM for the management of neck conditions. The meta-analysis identified a subset of homogeneous studies evaluating neck pain. The value of the pooled estimator (1.33) was statistically significant for the treatment effect of TSM in the studies with researcher effect removed (95 % confidence interval: 1.15, 1.52). This analysis suggests there is sufficient evidence to support the use of TSM for specific subgroups of patients with neck conditions. This review also identifies the need for further studies to examine the effectiveness of TSM to treat shoulder conditions and the effectiveness of TSM on neck conditions with long-term follow-up studies."

Salom-Moreno J, Ortega-Santiago R, Cleland JA, Palacios-Ceña M, Truyols-Domínguez S, Fernández-de-las-Peñas C. 2014 **Immediate changes in neck pain intensity and widespread pressure pain sensitivity in patients with bilateral chronic mechanical neck pain: a randomized controlled trial of thoracic thrust manipulation vs non-thrust mobilization.** J Manipulative Physiol Ther Jun;37(5):312-9 <https://www.ncbi.nlm.nih.gov/pubmed/24880778>

**"OBJECTIVE:**

The purpose of this study was to compare the effects of thoracic thrust manipulation vs thoracic non-thrust mobilization in patients with bilateral chronic mechanical neck pain on pressure pain sensitivity and neck pain intensity.

**METHODS:**

Fifty-two patients (58% were female) were randomly assigned to a thoracic spine thrust manipulation group or of thoracic non-thrust mobilization group. Pressure pain thresholds (PPTs) over C5-C6 zygapophyseal joint, second metacarpal, and tibialis anterior muscle and neck pain intensity (11-point Numerical Pain Rate Scale) were collected at baseline and 10 minutes after the intervention by an assessor blinded to group allocation. Mixed-model analyses of variance (ANOVAs) were used to examine the effects of the treatment on each outcome. The primary analysis was the group \* time interaction.

**RESULTS:**

No significant interactions were found with the mixed-model ANOVAs for any PPT (C5-C6:  $P > .252$ ; second metacarpal:  $P > .452$ ; tibialis anterior:  $P > .273$ ): both groups exhibited similar increases in PPT (all,  $P < .01$ ), but within-group and between-group effect sizes were small (standardized mean score difference [SMD]  $< 0.22$ ). The ANOVA found that patients receiving thoracic spine thrust manipulation experienced a greater decrease in neck pain (between-group mean difference: 1.4; 95% confidence interval, 0.8-2.1) than did those receiving thoracic spine non-thrust mobilization ( $P < .001$ ). Within-group effect sizes were large for both groups (SMD  $> 2.1$ ), and between-group effect size was also large (SMD = 1.3) in favor of the manipulative group.

**CONCLUSIONS:**

The results of this randomized clinical trial suggest that thoracic thrust manipulation and non-thrust mobilization induce similar changes in widespread PPT in individuals with mechanical neck pain; however, the changes were clinically small. We also found that thoracic thrust manipulation was more effective than thoracic non-thrust mobilization for decreasing intensity of neck pain for patients with bilateral chronic mechanical neck pain."

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."

Schwerla F, Bischoff A, Nurnberger A, Genter P, Guillaume JP, Resch KL. 2008 **Osteopathic treatment of patients with chronic non-specific neck pain: a randomised controlled trial of efficacy.** *Forsch Komplementmed* Jun;15(3):138-45 <https://www.ncbi.nlm.nih.gov/pubmed/18617745>

**"OBJECTIVE:**

Chronic non-specific neck pain (CNP) is a common, often disabling condition which still lacks a reliable therapeutic standard. Empiric evidence suggests that osteopathic interventions might be effective in alleviating CNP symptoms. A randomized controlled clinical trial of efficacy was performed to test this hypothesis.

**MATERIALS AND METHODS:**

135 CNP sufferers were identified through advertisements, and 41 patients who met all relevant predefined criteria were recruited. All participants received a 12-min session of sham ultrasound once a week for an average of 10 weeks. In addition, a test-dependent osteopathic intervention of 45 min was given to 24 participants every other week. 40 participants could be followed up for 12 weeks after the end of therapy. The main outcome parameter was pain intensity measured on a numeric rating scale (NRS, range: 0-10).

**RESULTS:**

There were 2 dropouts in the intervention group and 2 in the control group. Average pain intensity decreased from 4.7 to 2.2 in the osteopathic group ( $p < 0.0005$ ), and from 4.8 to 4.0 in the control group ( $p = 0.09$ ). The intergroup difference of longitudinal changes was clearly significant, too ( $p = 0.02$ ). Further slight but comparable reductions were observed at follow-up (0.3 and 0.4 NRS points, respectively). These changes seem to have a positive impact on quality of life, as assessed by generic and specific instruments such as the MOS SF-36 and the Northwick Park Pain Questionnaire.

**CONCLUSIONS:**

A series of test-dependent osteopathic interventions may be a promising therapeutic regimen for CNP sufferers. Further studies will have to demonstrate a) whether these findings are reproducible, and b) whether positive long-term outcomes can be achieved."

Bischoffa A, Nürnbergera A, Voigta P, Schwerla F, 2006 **Osteopathy alleviates pain in chronic non-specific neck pain: A randomized controlled trial** *International Journal of Osteopathic Medicine* Volume 9, Issue 1, March , Pages 45 <http://www.sciencedirect.com/science/article/pii/S1746068906000253>

"Empiric evidence suggests that osteopathic interventions might be effective in alleviating CNP symptoms. A randomized sham-controlled clinical trial was performed to test this hypothesis." "On a numeric rating scale (NRS, range: 0–10) average pain intensity decreased from 4.7 to 2.2 in the osteopathic group ( $P < 0.0005$ ), and from 4.8 to 4.0 in the sham group ( $P = 0.09$ ). The inter-group difference was highly significant ( $P = 0.002$ ). Comparably further slight reductions were observed during follow-up (0.3 and 0.4 NRS points, respectively). These changes seem to have a positive impact on quality of life, as measured by means of the SF-36 and the Northwick Park Pain Questionnaire."

"A series of osteopathic interventions seems a promising therapeutic regimen for [chronic neck pain] sufferers."

Martínez-Segura R, Fernández-de-las-Peñas C, Ruiz-Sáez M, López-Jiménez C, Rodríguez-Blanco C, 2006 **Immediate Effects on Neck Pain and Active Range of Motion After a Single**

**Cervical High-Velocity Low-Amplitude Manipulation in Subjects Presenting with Mechanical Neck Pain: A Randomized Controlled Trial** Journal of Manipulative and Physiological Therapeutics Volume 29, Issue 7, September , Pages 511–517 <http://www.ncbi.nlm.nih.gov/pubmed/16949939>

"Seventy patients with mechanical neck pain (25 males and 45 females, aged 20-55 years) participated in this study. The lateral gliding test was used to establish the presence of an intervertebral joint dysfunction at the C3 through C4 or C4 through C5 levels. Subjects were divided randomly into either an experimental group, which received an HVLA thrust, or a control group, which received a manual mobilization procedure. The outcome measures were active cervical range of motion and neck pain at rest assessed pretreatment and 5 minutes posttreatment by an assessor blinded to the treatment allocation of the patient. Intragroup and intergroup comparisons were made with parametric tests."

"Within-group changes showed a significant improvement in neck pain at rest and mobility after application of the manipulation ( $P < .001$ ). The control group also showed a significant improvement in neck pain at rest ( $P < .01$ ), flexion ( $P < .01$ ), extension ( $P < .05$ ), and both lateral flexions ( $P < .01$ ), but not in rotation. Pre-post effect sizes were large for all the outcomes in the experimental group ( $d > 1$ ), but were small to medium in the control mobilization group ( $0.2 < d < 0.6$ ). The intergroup comparison showed that the experimental group obtained a greater improvement than the control group in all the outcome measures ( $P < .001$ ). Decreased neck pain and increased range of motion were negatively associated for all cervical motions: the greater the increase in neck mobility, the less the pain at rest."

"Our results suggest that a single cervical HVLA manipulation was more effective in reducing neck pain at rest and in increasing active cervical range of motion than a control mobilization procedure in subjects suffering from mechanical neck pain."

McReynolds TM, Sheridan BJ. 2005 **Intramuscular ketorolac versus osteopathic manipulative treatment in the management of acute neck pain in the emergency department: a randomized clinical trial.** J Am Osteopath Assoc Feb;105(2):57-68 <http://www.ncbi.nlm.nih.gov/pubmed/15784928>

"Ketorolac tromethamine injected intramuscularly (IM) has been shown to be an effective analgesic in treating patients with acute musculoskeletal pain in the emergency department (ED). The authors compare the efficacy of a single dose of IM ketorolac to osteopathic manipulative treatment (OMT) as delivered in the ED for the management of acute neck pain. A randomized clinical trial was conducted in three EDs. A convenience sample of 58 patients with acute neck pain of less than three weeks' duration were enrolled. Subjective measures of pain intensity on an 11-point numerical rating scale were gathered from patients immediately before treatment and one hour afterward. Subjects received either OMT or 30 mg, IM ketorolac. Subjects' perceived pain relief was also recorded at one hour after treatment on a subjective 5-point pain relief scale. Twenty-nine patients received IM ketorolac, and 29 patients received OMT. Although both groups showed a significant reduction in pain intensity,  $1.7 \pm 1.6$  ( $P < .001$  [95% CI, 1.1-2.3]) and  $2.8 \pm 1.7$  ( $P < .001$  [95% CI, 2.1-3.4]), respectively, patients receiving OMT reported a significantly greater decrease in pain intensity ( $P = .02$  [95% CI, 0.2-1.9]). When comparing pain relief at one hour posttreatment, there was no significant difference between the OMT and ketorolac study groups ( $P = .10$ ). The authors found that, at one hour posttreatment, OMT is as efficacious as IM ketorolac in providing pain relief and significantly better in reducing pain intensity. The authors conclude that OMT is a reasonable alternative to parenteral nonsteroidal anti-inflammatory medication for patients with acute neck pain in the ED setting."

Cleland JA, Childs JD, McRae M, Palmer JA, Stowell T 2005 **Immediate effects of thoracic manipulation in patients with neck pain: a randomized clinical trial** Manual Therapy Volume 10, Issue 2, May , Pages 127–135 <http://www.ncbi.nlm.nih.gov/pubmed/15922233>

"Although the effectiveness of mobilization and manipulation of the cervical spine has been well documented, the small inherent risks associated with these techniques has led clinicians to frequently utilize manipulation directed at the thoracic spine in this patient population. It is hypothesized that thoracic spine manipulation may elicit similar therapeutic benefits as cervical

spine manipulation while minimizing the magnitude of risk associated with the cervical technique. The purpose of this randomized clinical trial was to investigate the immediate effects of thoracic spine manipulation on perceived pain levels in patients presenting with neck pain. The results suggest that thoracic spine manipulation results in immediate analgesic effects in patients with mechanical neck pain."

Williams NH, Wilkinson C, Russell I, Edwards RT, Hibbs R, Linck P, Muntz R 2003 **Randomized osteopathic manipulation study (ROMANS): pragmatic trial for spinal pain in primary care** Family Practice Volume 20, Issue 6 pp 662-669 <http://fampra.oxfordjournals.org/content/20/6/662.full>

"A pragmatic randomized controlled trial was carried out in a primary care osteopathy clinic accepting referrals from 14 neighbouring practices in North West Wales. A total of 201 patients with neck or back pain of 2–12 weeks duration were allocated at random between usual GP care and an additional three sessions of osteopathic spinal manipulation. The primary outcome measure was the Extended Aberdeen Spine Pain Scale (EASPS). Secondary measures included SF-12, EuroQol and Short-form McGill Pain Questionnaire. Health care costs were estimated from the records of referring GPs"

"Results. Outcomes improved more in the osteopathy group than the usual care group. At 2 months, this improvement was significantly greater in EASPS [95% confidence interval (CI) 0.7–9.8] and SF-12 mental score (95% CI 2.7–10.7). At 6 months, this difference was no longer significant for EASPS (95% CI –1.5 to 10.4), but remained significant for SF-12 mental score (95% CI 1.0–9.9). Mean health care costs attributed to spinal pain were significantly greater by £65 in the osteopathy group (95% CI £32–£155). Though osteopathy also cost £22 more in mean total health care cost, this was not significant (95% CI –£159 to £142).

Conclusion. A primary care osteopathy clinic improved short-term physical and longer term psychological outcomes, at little extra cost. Rigorous multicentre studies are now needed to assess the generalizability of this approach."

Perrin RN, Edwards J, Hartley P 1998 **An evaluation of the effectiveness of osteopathic treatment on symptoms associated with Myalgic Encephalomyelitis. A preliminary report** Journal of Medical Engineering & Technology January/February

"The term Myalgic Encephalomyelitis (ME) was initially used in the 1950s. ME describes a syndrome where there is general muscle pain associated with evidence of a disturbed nervous system. ME, commonly referred to as Chronic Fatigue Syndrome (CFS), or post-viral fatigue syndrome is a condition in which mental and physical fatigue predominate. It is characterized by gross abnormal muscle fatigue which occurs after relatively mild activity. Other symptoms regularly complained of include sleep disturbance, headaches, cognitive dysfunction, feeling depressed, bouts of low grade fever (not exceeding 38.6C), increased sensitivity to light, back and neck pain, sore throat, irritable bowel and bladder. The symptoms of ME typically become apparent following a viral infection"

"There has been a long-standing debate over the naming of this disorder. Some have expressed the opinion that ME is a highly specific disease, whereas CFS is an umbrella term covering many conditions which exhibit fatigue."

"The treatment of each ME patient consisted of the following techniques:

- (1) Soft tissue massage of the paravertebral muscles, the trapezii, levator scapulae, rhomboids and muscles of respiration.
- (2) High and low velocity manipulation of the thoracic and upper lumbar spinal segments using supine and side-lying combined leverage and thrust techniques.
- (3) Gentle articulation of thoracic and upper lumbar spine, plus the ribs. This was achieved by both long and short lever techniques.
- (4) Functional techniques to the suboccipital region and the sacrum.
- (5) Stimulation of the cranio-sacral rhythm by functional-cranial techniques.
- (6) Efflourage to aid drainage in thoracic and cervical lymphatic vessels.
- (7) Exercises to improve the mobility of the thoracic spine, and to improve the physical coordination."

"Our hypothesis, based on clinical evidence, is that following osteopathic treatment the symptoms are reduced due to stabilizing nffment sympathetic flow. It is believed by the authors

that this equilibrium may be achieved due to relaxation of soft tissue and an improvement in visceral function plus increased blood and lymph circulation."

"This present study has revealed a demonstrable improvement in ME symptoms as a result of osteopathic treatment."

Sterling M, Jull G, Wright A 2001 **Cervical mobilisation: concurrent effects on pain, sympathetic nervous system activity and motor activity**. *Manual Therapy* May;6(2):72-81  
<https://www.ncbi.nlm.nih.gov/pubmed/11414776>

"Recent findings that spinal manual therapy (SMT) produces concurrent hypoalgesic and sympathoexcitatory effects have led to the proposal that SMT may exert its initial effects by activating descending inhibitory pathways from the dorsal periaqueductal gray area of the midbrain (dPAG). In addition to hypoalgesic and sympathoexcitatory effects, stimulation of the dPAG in animals has been shown to have a facilitatory effect on motor activity. This study sought to further investigate the proposal regarding SMT and the PAG by including a test of motor function in addition to the variables previously investigated. Using a condition randomised, placebo-controlled, double blind, repeated measures design, 30 subjects with mid to lower cervical spine pain of insidious onset participated in the study. The results indicated that the cervical mobilisation technique produced a hypoalgesic effect as revealed by increased pressure pain thresholds on the side of treatment ( $P=0.0001$ ) and decreased resting visual analogue scale scores ( $P=0.049$ ). The treatment technique also produced a sympathoexcitatory effect with an increase in skin conductance ( $P<0.002$ ) and a decrease in skin temperature ( $P=<0.02$ ). There was a decrease in superficial neck flexor muscle activity ( $P<0.0002$ ) at the lower levels of a staged cranio-cervical flexion test. This could imply facilitation of the deep neck flexor muscles with a decreased need for co-activation of the superficial neck flexors. The combination of all findings would support the proposal that SMT may, at least initially, exert part of its influence via activation of the PAG."

Haller H, Lauche R, Cramer H, Rampp T, Saha FJ, Ostermann T, Dobos G 2016 **Craniosacral Therapy for the Treatment of Chronic Neck Pain: A Randomized Sham-controlled Trial** *Clin J Pain* May;32(5):441-9 <http://www.ncbi.nlm.nih.gov/m/pubmed/26340656/#ft>

"**MATERIALS AND METHODS:** A total of 54 blinded patients were randomized into either 8 weekly units of CST or light-touch sham treatment. Outcomes were assessed before and after treatment (week 8) and again 3 months later (week 20). The primary outcome was the pain intensity on a visual analog scale at week 8; secondary outcomes included pain on movement, pressure pain sensitivity, functional disability, health-related quality of life, well-being, anxiety, depression, stress perception, pain acceptance, body awareness, patients' global impression of improvement, and safety.

**RESULTS:** In comparison with sham, CST patients reported significant and clinically relevant effects on pain intensity at week 8 (-21 mm group difference; 95% confidence interval, -32.6 to -9.4;  $P=0.001$ ;  $d=1.02$ ) and at week 20 (-16.8 mm group difference; 95% confidence interval, -27.5 to -6.1;  $P=0.003$ ;  $d=0.88$ ). Minimal clinically important differences in pain intensity at week 20 were reported by 78% within the CST group, whereas 48% even had substantial clinical benefit. Significant between-group differences at week 20 were also found for pain on movement, functional disability, physical quality of life, anxiety and patients' global improvement. Pressure pain sensitivity and body awareness were significantly improved only at week 8. No serious adverse events were reported.

**DISCUSSION:** CST was both specifically effective and safe in reducing neck pain intensity and may improve functional disability and the quality of life up to 3 months after intervention."

## Case controlled studies

Number of studies: 1

Jesus-Moraleida FR, Ferreira PH, Pereira LS, Vasconcelos CM, Ferreira ML 2011 **Ultrasonographic analysis of the neck flexor muscles in patients with chronic neck pain and changes after cervical spine mobilization.** Journal of Manipulative and Physiological Therapeutics Oct;34(8):514-24 <https://www.ncbi.nlm.nih.gov/pubmed/21978544>

"The purpose of this study was to analyze changes in the recruitment of the muscles longus colli (Lco) and sternocleidomastoid (SCM) as measured by ultrasonography in patients with chronic neck pain before and immediately after a single cervical Maitland's posterior-anterior central mobilization technique.

**METHODS:** This was a cross-sectional, case-control research design study. Ultrasonographic images of Lco and SCM were taken in 31 patients with chronic neck pain and matched controls during the 5 phases of the craniocervical flexion test before and after a Maitland's posterior-anterior central mobilization session at the cervical spine. Changes in muscle thickness during the test were calculated to infer muscle recruitment. Separate analysis of variance models for each muscle was built.

**RESULTS:** Both groups showed increases in Lco and SCM recruitment between phases ( $F = 7.95, P < .001$ ;  $F = 21.29, P < .001$ ), with patients with chronic neck pain demonstrating lesser increases for Lco changes in thickness compared with controls, mainly at phase 5 ( $-0.09, P = .004$ ; 95% confidence interval [CI], 0.03-0.15). After the mobilization, Lco recruitment increased more significantly in patients with chronic neck pain, and previous difference between groups in phase 5 was no longer significant ( $-0.07, P = .07$ ; 95% CI,  $-0.14$  to  $0.01$ ). The SCM recruitment decreased in phase 1 for patients with chronic neck pain ( $P = .01$ ; 95% CI,  $-0.06$  to  $-0.01$ ).

**CONCLUSION:** Cervical mobilization appeared to modulate neck muscles function by increasing deep muscle and reducing superficial muscles recruitment."

## Other controlled clinical trials

Number of studies: 3

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."

Fryer G, Alvizatos J, Lamaro J 2005 **The effect of osteopathic treatment on people with chronic and sub-chronic neck pain: A pilot study** International Journal of Osteopathic Medicine Volume 8, Issue 2, June , Pages 41–48 <http://www.sciencedirect.com/science/article/pii/S1746068905000301>

## There was no independent control used in this study

"Seventeen subjects (mean age 34.8 [SD = 11.9] years, 7 males, 10 females) with neck pain (mean duration of symptoms of 168.8 weeks [SD = 292, range = 4–1040]) were recruited and included in this study. The subjects were offered a 4-week course of osteopathic treatment at a university teaching clinic. McGill pain questionnaires (MPQ), visual analogue scales (VAS), and neck disability index (NDI) were completed prior to the initial treatment and after treatments on weeks 2 and 4."

"Analysis with repeated measures ANOVA revealed statistically significant differences between pre- and post-scores for the MPQ ( $F_{2,32} = 17.35$ ,  $P = 0.001$ ), VAS ( $F_{1.62,25.92} = 36.01$ ,  $P < 0.001$ ) and NDI ( $F_{2,32} = 14.63$ ,  $P < 0.001$ ). Pre/post effect sizes were large for MPQ ( $d = 1.28$ ), VAS ( $d = 1.57$ ) and NDI ( $d = 1.12$ ) scores. Further testing using paired t-tests revealed these differences to be significant between all time periods for the MPQ, and between the pre-treatment and 2-week period and pre-treatment and 4-week period for the VAS and NDI, respectively. When the cohort was subdivided into a sub-chronic (symptom duration less than 52 weeks) and chronic group (symptoms longer than 52 weeks), similar significant differences were found in both groups."

"Self-rated pain and disability significantly reduced during the course of osteopathic treatment, and reductions were evident regardless of the chronicity of the pain. This pilot study suggests that osteopathic treatment may be effective for the management of neck pain."

McGregor C, Boyles R, Murahashi L, Sena T, Yarnall R 2014 **The immediate effects of thoracic transverse mobilization in patients with the primary complaint of mechanical neck pain: a pilot study.** *J Man Manip Ther* Nov;22(4):191-8 <https://www.ncbi.nlm.nih.gov/pubmed/25395827>

"A single-blinded quasi-experimental study with a one-group pretest-posttest design. A transverse group consisted of 21 participants whose neck pain increased with active movements. A non-intervention group of 20 asymptomatic participants was included simply to ensure rater blinding. The treatment group received Grades IV to IV+ transverse mobilizations at T1 through T4 bilaterally. Measurements taken immediately after intervention included pre/post cervical ROM, distant pressure pain threshold (PPT), and a numerical pain rating scale (NPRS). Analysis utilized t-tests and ordinal counterparts."

"The transverse group demonstrated significant gains in extension and bilateral rotation ( $P \leq 0.005$ ) but not flexion or side-bend. A total of 57% of mobilized participants reported clinically meaningful decreased pain ( $P < 0.001$ ). Seven participants exceeded the PPT MDC95 of 0.36 kg/cm<sup>2</sup>. The non-intervention group had no significant changes in ROM or NPRS scores. DISCUSSION: After 8 minutes of transverse mobilization to the upper thoracic spine, significant gains in cervical extension and bilateral rotation, and decreased pain scores were found. There were no adverse effects. Unlike other mobilization studies, PPT changes at a remote site were statistically but not clinically meaningful. Findings suggest that transverse mobilization would be a productive topic for controlled clinical trials."

## Cohort studies

Number of studies: 1

Harrison RE, Page JS 2011 **Multipractitioner Upledger CranioSacral Therapy: descriptive outcome study 2007-2008**. *The Journal of Alternative and Complementary Medicine* Jan;17 (1):13-7 <http://www.ncbi.nlm.nih.gov/pubmed/21214395>

"Outcome by diagnostic groups suggested that UCST [Upledger craniosacral therapy] is particularly effective for patients with headaches and migraine, neck and back pain, anxiety and depression, and unsettled babies. Seventy percent (70%) of patients on medication decreased or discontinued it, and patients' average general practitioner consultation rate fell by 60% in the 6 months following treatment."

"Patients' ages ranged from neonates to 68 years. Seventy-four percent (74%) of patients reported a valuable improvement in their presenting problem. Sixty-seven percent (67%) also reported a valuable improvement in their general well-being and/or a second health problem. Outcome by diagnostic groups suggested that UCST is particularly effective for patients with headaches and migraine, neck and back pain, anxiety and depression, and unsettled babies."

## Case series

Number of studies: 1

Fernández-de-las-Peñas C, Palomeque-del-Cerro L, Rodríguez-Blanco C, Gómez-Conesa A, Miangolarra-Page JC 2007 **Changes in Neck Pain and Active Range of Motion After a Single Thoracic Spine Manipulation in Subjects Presenting with Mechanical Neck Pain: A Case Series** *Journal of Manipulative and Physiological Therapeutics* Volume 30, Issue 4, May , Pages 312–320 <http://www.ncbi.nlm.nih.gov/pubmed/17509440>

"Seven patients with mechanical neck pain (2 men, 5 women), 20 to 33 years old, were included. All patients received a single thoracic manipulation by an experienced manipulative therapist. The outcome measures of these cases series were neck pain at rest, as measured by a numerical pain rating scale; active cervical range of motion; and neck pain at the end of each neck motion (eg, flexion or extension). These outcomes were assessed pre treatment, 5 minutes post manipulation, and 48 hours after the intervention. A repeated-measures analysis was made with parametric tests. Within-group effect sizes were calculated using Cohen d coefficients."

"A significant ( $P < .001$ ) decrease, with large within-group effect sizes ( $d > 1$ ), in neck pain at rest were found after the thoracic spinal manipulation. A trend toward an increase in all cervical motions (flexion, extension, right or left lateral flexion, and right or left rotation) and a trend toward a decrease in neck pain at the end of each cervical motion were also found, although differences did not reach the significance ( $P > .05$ ). Nevertheless, medium to large within-group effect sizes ( $0.5 < d < 1$ ) were found between preintervention data and both postintervention assessments in both active range of motion and neck pain at the end of each neck motion."

"The present results demonstrated a clinically significant reduction in pain at rest in subjects with mechanical neck pain immediately and 48 hours following a thoracic manipulation. Although increases in all tested ranges of motion were obtained, none of them reached statistical significance at either posttreatment point. The same was found for pain at the end of range of motion for all tested ranges, with the exception of pain at the end of forward flexion at 48 hours. More than one mechanism likely explains the effects of thoracic spinal manipulation. Future controlled studies comparing spinal manipulation vs spinal mobilization of the thoracic spine are required."

## Case reports

Number of studies: 1

### Leach J 2008 **Osteopathic support for a survivor of gastric cancer: A case report**

International Journal of Osteopathic Medicine Volume 11, Issue 3, September , Pages 106–111

<http://www.sciencedirect.com/science/article/pii/S174606890800031X>

"An older male patient received eight consultations over a period of 10 months, some three years after his cancer diagnosis and treatment. Osteopathic management included manual treatment to improve musculoskeletal mobility, cranial osteopathic treatment to release tension in the deeper fascia, discussion of dietary strategies and advice and education about the origin of his symptoms due to a total gastrectomy and cancer chemotherapy. After treatment his physical symptoms were reduced. His neck pain was reduced. Nausea and discomfort after eating disappeared. Frequency of diarrhoea, breathlessness and fatigue were improved. He gained weight and resumed social activities. "

"Osteopathic consultations provide time to engage in complex problems that may benefit from a holistic approach. The touch and body work involved in osteopathy can help the patient come to terms with altered body image and to talk openly about anxieties. The Hay approach to diet appeared to be valuable in improving the quality of life for this particular patient after his gastrectomy."

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

Number  
of studies:  
1

## Randomised controlled trials

Number of studies: 1

Haller H, Lauche R, Cramer H, Gass F, Rampf T, Saha F, Dobos G 2012 **Craniosacral therapy in chronic neck pain patients—a randomised sham-controlled trial** European Journal of Integrative Medicine September; 28-29 [http://www.researchgate.net/publication/257710444\\_Craniosacral\\_therapy\\_in\\_chronic\\_neck\\_pain\\_patients\\_a\\_randomised\\_sham-controlled\\_trial](http://www.researchgate.net/publication/257710444_Craniosacral_therapy_in_chronic_neck_pain_patients_a_randomised_sham-controlled_trial)

*net/publication/257710444\_Craniosacral\_therapy\_in\_chronic\_neck\_pain\_patients\_a\_randomised\_sham-controlled\_trial*

"Preliminary intention-to-treat analysis revealed significant less pain intensity in the CST group compared to the sham group ( $p = 0.017$ ). With time, group differences on neck-pain-specific disability and pressure pain thresholds showed a positive trend, but did not achieve the level of significance. CST patients reported also strong global improvement, while the sham group rated between "no change" and only "a little better"."

## It is unclear whether the following journals are peer-reviewed

Number  
of studies:  
1

## Clinically and statistically significant results

Number  
of studies:  
1

Haller H, Cramer H, Lauche R, Dobos G, Berger B 2015 **Patients' experiences of Craniosacral Therapy in the treatment of chronic neck pain: a qualitative analysis of health outcomes** ICCMR Poster Presentation Abstracts [https://www.uni-due.de/naturheilkunde/files/haller\\_iccmr\\_cranios.pdf](https://www.uni-due.de/naturheilkunde/files/haller_iccmr_cranios.pdf)

**This study used a sub-sample of a randomized control trial, but there was no control for this specific investigation.**

"Methods: A subsample of chronic non-specific neck pain patients was selected from a randomized controlled trial examining the efficacy of CST in comparison to sham (NCT01526447). At baseline 19 patients (mean age  $42.5 \pm 10.4$ ; 13 female) of the CST group were asked to complete drawings of their perceived body shape and pain areas. Drawings were repeated after 8 weekly treatments and were followed by a semi-structured interview. Data were analyzed using qualitative content analysis.

Results: Changes due to CST were reported at various levels of human experiencing. Most patients described positive changes in more than one of the following domains: physical (less intensity of pain, headache and dizziness, improved sleep and range of motion), perceptual (more upright and symmetrical posture, sustained deep relaxation), emotional (pain is less threatening, increased calm, confidence and hope), cognitive (increased body awareness and self-efficacy, extinction of pain memory, increased concentration and less mind cinema), spiritual (sense of basic trust and peace), behavioral (moving in action alternatives, actively avoid stress, sport is again possible), social (more social contacts and activities) and economic domain (less pain medication, improved work efficiency). Several patients reported initial aggravation of symptoms, but no persisting or serious adverse events."