Collected Scientific Research Relating to the Use of Osteopathy with Nerve pain and symptoms including stenosis

Important:

1) Osteopathy involves helping people's own self-healing abilities to work better, rather that 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: 16

Clinically and statistically significant results

Number of studies: 15

Systematic reviews

Number of studies: 1

Whitman JM, Flynn TW, Fritz JM. 2003 **Nonsurgical management of patients with lumbar spinal stenosis: a literature review and a case series of three patients managed with physical therapy.** Phys Med Rehabil Clin N Am Feb;14(1):77-101, vi-vii *https://www.ncbi.nlm.nih.gov/pubmed/12622484*

> "This article critically reviews the available literature regarding nonsurgical management for lumbar spinal stenosis (LSS) and presents a case series of three patients managed with manual physical therapy. This case series uses a well-defined, impairment-based, noninvasive, outpatient treatment program for patients with LSS and provides patient-centered, long-term outcome information. The outpatient treatment program focuses on patients' individualized, prioritized impairments identified on initial examination, and emphasizes manual physical therapy techniques targeting each patient's impairments, specific exercises to either reinforce the manual physical therapy treatment or strengthen specific muscles, and a walking program. The results demonstrate that patients with LSS can make significant gains in disability, symptoms, and function in relatively short periods of time and that these gains can be maintained for up to 18 months. Under this physical therapy program, patients experienced significant improvements, and the potential adverse effects of invasive therapies or pharmacologic management strategies, which often are included in other "nonsurgical" treatment programs, were avoided."

Other reviews

Number of studies: 2

Backstrom KM, Whitman JM, Flynn TW. 2011 **Lumbar spinal stenosis-diagnosis and management of the aging spine.** Manual Therapy Aug;16(4):308-17 *http://www.ncbi.nlm.nih.gov/pubmed/21367646*

> "Low back pain and lumbar spinal stenosis (LSS) is an extensive problem in the elderly presenting with pain, disability, fall risk and depression. The incidence of LSS is projected to continue to grow as the population ages. In light of the risks, costs and lack of long-term results associated with surgery, and the positive outcomes in studies utilizing physical therapy interventions for the LSS patient, a non-invasive approach is recommended as a first line of intervention. This Masterclass presents an overview of LSS in terms of clinical examination, diagnosis, and intervention. A focused management approach to the patient with LSS is put forward that emphasizes a defined four-fold approach of patient education, manual physical therapy, mobility and strengthening exercises, and aerobic conditioning."

Rademeyer I 2003 **Manual therapy for lumbar spinal stenosis: a comprehensive physical**

therapy approach. Phys Med Rehabil Clin N Am Feb;14(1):103-10, vii *http://www.ncbi.nlm.nih.gov/pubmed/12622485*

> "A physical therapy approach to lumbar spinal stenosis involves techniques directed at opening up the neurovascular spaces in the lumbar spine to reduce the stenosis. This entails manual therapy techniques for improving intervertebral motion, regaining neural mobility, and restoring muscle function, followed by an active exercise program that often involves flexion exercises. Techniques for unloading the spine and patient education are included in this physical therapy approach. A successful functional outcome requires a comprehensive and individualized approach to the patient with spinal stenosis."

Randomised controlled trials

Number of studies: 5

Wolny T, Saulicz E, Linek P, Shacklock M, Myśliwiec A 2017 **Efficacy of Manual Therapy Including Neurodynamic Techniques for the Treatment of Carpal Tunnel Syndrome: A Randomized Controlled Trial.** Journal of Manipulative and Physiological Therapeutics May;40 (4):263-272 *https://www.ncbi.nlm.nih.gov/pubmed/28395984*

> "OBJECTIVE:
> The purpose of this randomized trial was to compare the efficacy of manual therapy, including the use of neurodynamic techniques, with electrophysical modalities on patients with mild and moderate carpal tunnel syndrome (CTS).
> METHODS:
> The study included 140 CTS patients who were randomly assigned to the manual therapy (MT) group, which included the use of neurodynamic techniques, functional massage, and carpal bone mobilizations techniques, or to the electrophysical modalities (EM) group, which included laser and ultrasound therapy. Nerve conduction, pain severity, symptom severity, and functional status measured by the Boston Carpal Tunnel Questionnaire were assessed before and after treatment. Therapy was conducted twice weekly and both groups received 20 therapy sessions.
> RESULTS:
> A baseline assessment revealed group differences in sensory conduction of the median nerve ($P < .01$) but not in motor conduction ($P = .82$). Four weeks after the last treatment procedure, nerve conduction was examined again. In the MT group, median nerve sensory conduction velocity increased by 34% and motor conduction velocity by 6% (in both cases, $P < .01$). There was no change in median nerve sensory and motor conduction velocities in the EM. Distal motor latency was decreased ($P < .01$) in both groups. A baseline assessment revealed no group differences in pain severity, symptom severity, or functional status. Immediately after therapy, analysis of variance revealed group differences in pain severity ($P < .01$), with a reduction in pain in both groups (MT: 290%, $P < .01$; EM: 47%, $P < .01$). There were group differences in symptom severity ($P < .01$) and function ($P < .01$) on the Boston Carpal Tunnel Questionnaire. Both groups had an improvement in functional status (MT: 47%, $P < .01$; EM: 9%, $P < .01$) and a reduction in subjective CTS symptoms (MT: 67%, $P < .01$; EM: 15%, $P < .01$).
> CONCLUSION:
> Both therapies had a positive effect on nerve conduction, pain reduction, functional status, and subjective symptoms in individuals with CTS. However, the results regarding pain reduction, subjective symptoms, and functional status were better in the MT group."

Fernández-de-Las-Peñas C, Cleland J, Palacios-Ceña M, Fuensalida-Novo S, Pareja JA, Alonso-Blanco C 2017 **The Effectiveness of Manual Therapy Versus Surgery on Self-reported Function, Cervical Range of Motion, and Pinch Grip Force in Carpal Tunnel Syndrome: A Randomized Clinical Trial.** J Orthop Sports Phys Ther Mar;47(3):151-161 *https://www.ncbi.nlm.nih.gov/pubmed/28158963*

> "Study Design Randomized parallel-group trial. Background Carpal tunnel syndrome (CTS) is a common pain condition that can be managed surgically or conservatively. Objective To compare

the effectiveness of manual therapy versus surgery for improving self-reported function, cervical range of motion, and pinch-tip grip force in women with CTS. Methods In this randomized clinical trial, 100 women with CTS were randomly allocated to either a manual therapy (n = 50) or a surgery (n = 50) group. The primary outcome was self-rated hand function, assessed with the Boston Carpal Tunnel Questionnaire. Secondary outcomes included active cervical range of motion, pinch-tip grip force, and the symptom severity subscale of the Boston Carpal Tunnel Questionnaire. Patients were assessed at baseline and 1, 3, 6, and 12 months after the last treatment by an assessor unaware of group assignment. Analysis was by intention to treat, with mixed analyses of covariance adjusted for baseline scores. Results At 12 months, 94 women completed the follow-up. Analyses showed statistically significant differences in favor of manual therapy at 1 month for self-reported function (mean change, -0.8; 95% confidence interval [CI]: -1.1, -0.5) and pinch-tip grip force on the symptomatic side (thumb-index finger: mean change, 2.0; 95% CI: 1.1, 2.9 and thumb-little finger: mean change, 1.0; 95% CI: 0.5, 1.5). Improvements in self-reported function and pinch grip force were similar between the groups at 3, 6, and 12 months. Both groups reported improvements in symptom severity that were not significantly different at all follow-up periods."

Whelan G, Johnston R, Millward C, Edwards DJ 2017 **The immediate effect of osteopathic cervical spine mobilization on median nerve mechanosensitivity: A triple-blind, randomized, placebo-controlled trial** Journal of Bodywork and Movement Therapies 18 May 2017 *http://www.sciencedirect.com/science/article/pii/S1360859217301092*

"Methodology
Thirty asymptomatic participants were assessed and randomly allocated to either a control, sham or mobilization group, where they were all given a neurodynamic test and ROM was assessed.
Results
The results showed that the mobilization group had the greatest and most significant increase in ROM with Change-Left $p < 0.05$ and Change-Right $p < 0.05$ compared against the control group, and Change-Left $p < 0.01$ and Change-Right $p < 0.05$ compared against the sham group.
Conclusions
This study has highlighted that, as expected, cervical mobilization has an effect at reducing upper limb neural mechanical sensitivity. However, there may be other factors interacting with neural mechanosensitivity outside of somatic influences such as psychological expectation bias. Further research could utilize the methodology employed here, but with other treatment areas to help develop neural tissue research. In addition to this, further exploration of psychological factors should be made such as utilizing complex top-down cognitive processing theories such as the neuromatrix or categorization theories to help further understand cognitive biases such as the placebo effect, which is commonly ignored in osteopathic research, as well as other areas of science, and which would further complete a holistic perspective."
"The results showed that the mobilization group had the greatest and most significant increase in ROM with Change-Left $p < 0.05$ and Change-Right $p < 0.05$ compared against the control group, and Change-Left $p < 0.01$ and Change-Right $p < 0.05$ compared against the sham group."

Burke J, Buchberger DJ, Carey-Loghmani MT, Dougherty PE, Greco DS, Dishman JD. 2007 **A pilot study comparing two manual therapy interventions for carpal tunnel syndrome.** Journal of Manipulative and Physiological Therapeutics Jan;30(1):50-61 *http://www.ncbi.nlm.nih.gov/pubmed/17224356*

"The purpose of this study was to determine the clinical efficacy of manual therapy interventions for relieving the signs and symptoms of carpal tunnel syndrome (CTS) by comparing 2 forms of manual therapy techniques: Graston Instrument-assisted soft tissue mobilization (GISTM) and STM [soft tissue massage] administered with the clinician hands."
"After both manual therapy interventions, there were improvements to nerve conduction latencies, wrist strength, and wrist motion. The improvements detected by our subjective evaluations of the signs and symptoms of CTS and patient satisfaction with the treatment outcomes provided additional evidence for the clinical efficacy of these 2 manual therapies for

CTS. The improvements were maintained at 3 months for both treatment interventions. Data from the control hand did not change across measurement time points."

Whitman JM, Flynn TW, Childs JD, Wainner RS, Gill HE, Ryder MG, Garber MB, Bennett AC, Fritz JM 2006 **A comparison between two physical therapy treatment programs for patients with lumbar spinal stenosis: a randomized clinical trial.** Spine (Phila Pa 1976) Oct 15;31 (22):2541-9 *http://www.ncbi.nlm.nih.gov/pubmed/17047542*

"Fifty-eight patients with lumbar spinal stenosis were randomized to one of two 6-week physical therapy programs. One program included manual physical therapy, body weight supported treadmill walking, and exercise (Manual Physical Therapy, Exercise, and Walking Group), while the other included lumbar flexion exercises, a treadmill walking program, and subtherapeutic ultrasound (Flexion Exercise and Walking Group). Perceived recovery was assessed with a global rating of change scale. Secondary outcomes included: Oswestry, a numerical pain rating scale, a measure of satisfaction, and a treadmill test. Testing occurred at baseline, 6 weeks, and 1 year. Perceived recovery, pain, and other healthcare resources used were collected with a long-term follow-up questionnaire."
"A greater proportion of patients in the manual physical therapy, exercise, and walking group reported recovery at 6 weeks compared with the flexion exercise and walking group (P = 0.0015), with a number needed to treat for perceived recovery of 2.6 (confidence interval, 1.8 -7.8). At 1 year, 62% and 41% of the manual therapy, exercise, and walking group and the flexion exercise and walking group, respectively, still met the threshold for recovery. Improvements in disability, satisfaction, and treadmill walking tests favored the manual physical therapy, exercise, and walking group at all follow-up points."
"Patients with lumbar spinal stenosis can benefit from physical therapy. Additional gains may be realized with the inclusion of manual physical therapy interventions, exercise, and a progressive body-weight supported treadmill walking program."

Cohort studies

Number of studies: 1

Ammendolia C, Chow N 2015 **Clinical outcomes for neurogenic claudication using a multimodal program for lumbar spinal stenosis: a retrospective study.** Journal of Manipulative and Physiological Therapeutics Mar-Apr;38(3):188-94 *http://www.ncbi.nlm.nih.gov/pubmed*

"The purpose of this preliminary study was to assess the effectiveness of a 6-week, nonsurgical, multimodal program that addresses the multifaceted aspects of neurogenic claudication."
"In this retrospective study, 2 researchers independently extracted data from the medical records from January 2010 to April 2013 of consecutive eligible patients who had completed the 6-week Boot Camp Program. The program consisted of manual therapy twice per week (eg, soft tissue and neural mobilization, chiropractic spinal manipulation, lumbar flexion-distraction, and muscle stretching), structured home-based exercises, and instruction of self-management strategies. A paired t test was used to compare differences in outcomes from baseline to 6-week follow-up. Outcomes included self-reported pain, disability, walking ability, and treatment satisfaction."
"A total of 49 patients were enrolled, with a mean age of 70 years. The mean difference in the Oswestry Disability Index was 15.2 (95% confidence interval [CI], 11.39-18.92), and that for the functional and symptoms scales of the Swiss Spinal Stenosis Questionnaire was 0.41 (95% CI, 0.26-0.56) and 0.74 (95% CI, 0.55-0.93), respectively. Numeric pain scores for both leg and back showed statistically significant improvements. Improvements in all outcomes were clinically important."
"This study showed preliminary evidence for improved outcomes in patients with neurogenic claudication participating in a 6-week nonsurgical multimodal Boot Camp Program."

Case series

Number of studies: 1

Sucher BM 1994 **Palpatory diagnosis and manipulative management of carpal tunnel syndrome.** J Am Osteopath Assoc Aug;94(8):647-63 *http://www.ncbi.nlm.nih.gov/pubmed/7960973*

> "Carpal tunnel syndrome was studied by use of supplemental palpatory diagnosis in 20 abnormal wrists. Restriction in motion at the carpal tunnel was quantified with a rating system. All wrists with carpal tunnel syndrome revealed at least moderate restriction to motion, as compared with only mild or no restriction in 20 wrists in normal, symptom-free subjects. Several participants (16 abnormal wrists) underwent osteopathic manipulative treatment, including a new "opponens roll" maneuver, and self-stretching, or a similar treatment accomplished by use of a self-treatment accomplished by use of a self-treatment appliance. In those treated, palpatory restriction decreased into the normal range, often before symptoms decreased. Improvement in nerve conduction studies usually followed within 1 to 3 months. Palpatory diagnosis is a useful adjunctive method of assessing patient status in carpal tunnel syndrome and helpful in prognosticating outcome. The modified manipulative technique described for the treatment of mild to moderate carpal tunnel syndrome may be effective in more severe cases."

Case reports

Number of studies: 4

Genese JS 2013 **Osteopathic manipulative treatment for facial numbness and pain after whiplash injury.** J Am Osteopath Assoc Jul;113(7):564-7 *http://www.ncbi.nlm.nih.gov/pubmed/23843380*

> "Whiplash injury is often caused by rear-end motor vehicle collisions. Symptoms such as neck pain and stiffness or arm pain or numbness are common with whiplash injury. The author reports a case of right facial numbness and right cheek pain after a whiplash injury. Osteopathic manipulative treatment techniques applied at the level of the cervical spine, suboccipital region, and cranial region alleviated the patient's facial symptoms by treating the right-sided strain of the trigeminal nerve. The strain on the trigeminal nerve likely occurred at the upper cervical spine, at the nerve's cauda, and at the brainstem, the nerve's point of origin. The temporal portion of the cranium played a major role in the strain on the maxillary."

Lavelle JM, McKeigue ME. 2009 **Musculoskeletal dysfunction and drop foot: diagnosis and management using osteopathic manipulative medicine.** J Am Osteopath Assoc Dec;109(12):648-50 *http://www.ncbi.nlm.nih.gov/pubmed/20023221*

> "Drop foot arises from dysfunction within the anatomic, muscular, or neurologic aspects of the lower extremity. The authors describe a patient with drop foot who had a compressed common peroneal nerve caused by posterior fibular head dysfunction. One 15-minute session of osteopathic manipulative treatment resolved the patient's symptoms. It is important for physicians to use osteopathic manipulative medicine to diagnosis and manage this condition, particularly when it results from fibular head dysfunction."

Lancaster DG, Crow WT. 2006 **Osteopathic manipulative treatment of a 26-year-old woman with Bell's palsy.** J Am Osteopath Assoc May;106(5):285-9 *http://www.ncbi.nlm.nih.gov/pubmed/16717371*

> "Bell's palsy is caused by a lesion of the facial nerve and results in unilateral paralysis or paresis of the face. The condition affects approximately 23 in 100,000 persons, with onset typically occurring between the ages of 10 and 40 years. The authors report the case of a 26-year-old woman with Bell's palsy, whom they treated with osteopathic manipulative treatment that was

focused on the enhancement of lymphatic circulation. The osteopathic manipulative procedures used involved reducing restrictions around four key diaphragms (thoracic outlet, respiratory diaphragm, suboccipital diaphragm, cerebellar tentorium), as well as applying the thoracic pump, muscle energy, primary respiratory mechanism, and osteopathy in the cranial field. The authors, who were guided by the four principles of osteopathic philosophy, report that the patient's symptoms resolved within 2 weeks, during which two sessions of osteopathic manipulative treatment, each lasting approximately 20 minutes, were held. Patient recovery occurred without the use of pharmaceuticals."

Barke L, Gelman S, Lipton JA 1997 **A successful use of cranial-sacral osteopathy in the treatment of post-traumatic headache following subarachnoid hemorrhage** AAO Journal Summer, 22-23 *https://www.iahe.com/docs/articles/Successful_use_of_cranial-sacral_osteopathy_-_headache_and_hemorrhage.pdf*

"In this case the physical medicine approach, including osteopathic manipulative medicine, was a benefit to the patient in the treatment of a posttraumatic headache."

Non-human studies

Number of studies: 1

Sucher BM, Hinrichs RN. 1998 **Manipulative treatment of carpal tunnel syndrome: biomechanical and osteopathic intervention to increase the length of the transverse carpal ligament.** J Am Osteopath Assoc Dec;98(12):679-86 *http://www.ncbi.nlm.nih.gov/pubmed/9885488*

"To quantify the amount of transverse carpal ligament (TCL) elongation in response to osteopathic manipulation or sustained load bearing (or both), a study involving seven cadaver limbs was conducted. Distances from the trapezium to the hamate (distance A) and from the scaphoid to the pisiform (distance B) were measured in five mounted cadaver limbs during and after the limbs bore the weight (2 newtons [N] to 4 N) for 2 several-hour periods. A several-hour period occurred between the weight bearing to assess recoil. Distances A and B were measured before and after the limbs were manipulated, according to previously described techniques, as well as with a new maneuver, termed the \"guywire\" technique. Two dissected limbs also were subjected to further weight bearing, this time increased to 8 N. Greater weight loads produced greater lengthening of the TCL, and recoil after removal of weight loads was slower than recoil after manipulation. Manipulation was more effective than weight loading for increasing distance A (distal canal), but weight loading generally was more effective than manipulation for increasing distance B (proximal canal). The guywire manipulation combined with direct transverse extension appeared to have the greatest impact on lengthening the TCL distally. These results show promise for the effective use of manipulation and load bearing for TCL elongation and nonsurgical relief of pressure on the median nerve in patients with carpal tunnel syndrome."

Mixed results (significant for some outcomes, not others)

Number of studies: 1

Other controlled clinical trials

Number of studies: 1

Burnham T, Higgins DC, Burnham RS, Heath DM. 2015 **Effectiveness of osteopathic manipulative treatment for carpal tunnel syndrome: a pilot project.** J Am Osteopath Assoc Mar;115(3):138-48 *http://jaoa.org/article.aspx?articleid=2211853*

> "Osteopathic manipulative treatment resulted in patient-perceived improvement in symptoms and function associated with CTS [carpal tunnel syndrome]. However, median nerve function and morphology at the carpal tunnel did not change, possibly indicating a different mechanism by which OMT acted, such as central nervous system processes."