



SCIENTIFIC EVIDENCE IN VISCERAL OSTEOPATHY

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ARTICLES ON VISCERAL OSTEOPATHY

KEY

- › LR = Literature Review.
- › CC = Clinical Case Study.
- › BRCT = Blinded Randomised Controlled Trial.
- › PS = Pilot Study.
- › NCES = Non Controlled Experimental Study.
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Franke H, Hoesele K. *Osteopathic manipulative treatment for lower urinary tract symptoms in women.* J Bodyw Mov Ther. 2013 Jan; 17(1):11-8. [LR](#)

The objective of this review was to determine the clinical effects of osteopathic treatment on female lower urinary tract disorders.

A systematic literature search was performed in May 2011 in the electronic databases Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, CINAHL, PEDro, OSTMED-DR, OSTEOPATHIC WEBRESEARCH and databases of ongoing trials. A manual search in reference lists and a personal communication with experts in the field of osteopathy was also conducted to identify additional studies.

Only randomized clinical studies (RCT) or controlled clinical studies (CCT) were included.

Inclusion criteria of the participants were female, at least 18 years old and a diagnosed female urinary tract disorder. The exclusion criteria were: neurologic disorders, tumors, urinary tract infections or antibiotic treatment, and pregnancy.

Two review authors independently extracted the data of the studies using a standardized data extraction form. The updated Cochrane Risk of bias tool from 2011 was used to assess the methodological quality.

The quantitative analysis shows a statistically significant and clinically relevant improvement when the osteopathic intervention was compared to an untreated group. Two studies which compare OMT with the pelvic floor muscle training as a reference treatment document almost the same therapeutic effect.

The findings of this systematic review and meta-analysis are promising and encouraging to conduct larger, rigorous osteopathic intervention studies for female urination disorders.

Future studies should compare the osteopathic treatment with established standard procedures in the control group.



Müller A, Franke H, Resch KL, Fryer G. *Effectiveness of osteopathic manipulative therapy for managing symptoms of irritable bowel syndrome: a systematic review.* J Am Osteopath Assoc. 2014 Jun; 114(6):470-9. [LR](#)

Irritable bowel syndrome (IBS) is a common and often lifelong functional gastrointestinal disorder.

There is a scarcity of effective management options for IBS.

The objective of the study was to assess the effectiveness of osteopathic manipulative therapy (OMT) for managing the symptoms of IBS.

Articles without language or publication-date restriction were searched in PubMed, Embase, Cochrane Library, PEDro, OSTMED.DR, and Osteopathic Research Web. Search terms included irritable bowel syndrome, IBS, functional colonic disease, colon irritable, osteopath*, osteopathic manipulation, osteopathic medicine, clinical trial, and randomized clinical trial. Experts in the field of visceral osteopathy were also contacted to identify additional studies.

The authors evaluated randomized controlled trials (RCTs) of OMT for IBS in adults in whom IBS was diagnosed using Rome (I-III) criteria. If OMT was not the sole intervention in the intervention group and if the same additional interventions were not applied to the control group, the study was excluded.

Citation identification, study selection, and data extraction were independently undertaken by 2 reviewers with a data extraction form from the Cochrane Collaboration. A consensus method was used to resolve disagreements concerning the assessment of the methodologic quality of the RCTs that were reviewed.

The search identified 10 studies that examined OMT for patients with IBS; 5 studies (204 patients) met the inclusion criteria. All studies were assessed as having low risk of bias according to the Cochrane Collaboration criteria, although there was heterogeneity in the outcome measures and control interventions. Three studies used visual analogue scales for abdominal pain, whereas others used the IBS severity score and the Functional Bowel Disorder Severity Index.

A variety of secondary outcomes were used. All studies reported more pronounced short-term improvements with OMTh compared with sham therapy or standard care only. These differences remained statistically significant after variable lengths of follow-up in 3 studies.

The present systematic review provides preliminary evidence that OMTh may be beneficial in the treatment of patients with IBS. However, caution is required in the interpretation of these findings because of the limited number of studies available and the small sample sizes.



Goyal K, Goyal M, Narkeesh K, John Samuel A, Sharma S, Chatterjee S, Arumugam N. *The effectiveness of osteopathic manipulative treatment in an abnormal uterine bleeding related pain and health related quality of life (HR-QoL) - A case report.* J Bodyw Mov Ther. 2017 Jul; 21(3):569-573. [CCS](#)

Abnormal uterine bleeding is characterized by painful and/or excessive menorrhagia, chronic pelvic pain due to the endometriosis (Em).

Osteopathic treatment is commonly used in the gynecological dysfunctions. The aim of the present case study was to explore the effect of osteopathic treatment (OT) for a woman with abnormal uterine bleeding related pain and quality of life (QoL).

We reported a case of 29 year old female who presented with chief complaints of increased flow during periods, lower abdominal pain, leukorrhoea, lower back pain and with occasional constipation for the last 3 years. Patient is a mother of 6 years old male child born with normal delivery.

On diagnostic ultrasonography the uterus was found bulky with insignificant endometriosis and no other abnormality was detected. She did not have any relevant past medical and surgical history.

The pre and post osteopathic treatment measurements were measured using Visual Analog Scale (VAS) and the health related quality of life (HR-QoL) questionnaire called short form Endometriosis Health Profile Questionnaire (EHP) – 5.

In the present case the pain due to the endometriosis was treated with the osteopathic treatment consists of all the major diaphragms' release (release of pelvic diaphragm, abdominal diaphragm, thoracic outlet release and hyoid diaphragm) during the first session and in the second session gastro-esophageal (GE) junction release, sigmoid colon release, cranial therapy to the occiput, sacral release and dural tube rocking.

Following that improvement of pain from VAS 8.3/10 to 3.9/10 and QoL improvement from EHP-5, 72/100 to 26/100 was noted. Osteopathic manipulative approach (OMA) in the patient with Em might improve the abnormal uterine bleeding related pain and health related quality of life (HR-QoL).

Darai C, Bendifallah S, Foulot H, Ballester M, Chabbert-Bufferet N, Darai E. *Impact of osteopathic manipulative therapy in patient with deep with colorectal endometriosis: A classification based on symptoms and quality of life.* Gynecol Obstet Fertil Senol. 2017 Sep; 45(9):472-477. [BRCT](#)

A prospective study to evaluate the clinical impact of osteopathic manipulative therapy (OMT) on symptoms and quality of life (QOL) of patients with colorectal endometriosis.

Forty-six patients with colorectal endometriosis completed the SF-36 QOL and symptoms questionnaire before and after OMT. A comparison and clustering analysis was performed to identify subgroups of patient's profile and symptom classification.



The mean age of the patients was 32 ± 6.2 years. Prior surgery for endometriosis was recorded in 73.9% of cases but none for deep infiltrating endometriosis. About three-quarters of the patients were nulliparous. The time between pre- and post-OMT completion of questionnaires was 28 days (15-63). A significant improvement in SF-36 QOL physical component summary ($P < 0.001$) and mental component summary ($P < 0.001$) was observed after OMT. Similarly, a significant improvement in gynecological, digestive and general symptoms values was observed. A clustering analysis allowed identifying four profiles of patients with colorectal endometriosis based on symptoms and a respective OMT gain of 30%, 60%, 64% and 45%.

These results support that OMT improve QOL and endometriosis symptoms of patients with colorectal endometriosis. Moreover, this symptom classification based on OMT gain can serve to design future randomized trial.

Sillem M, Juhasz-Böss I, Klausmeier I, Mechsner S, Siedentopf F, Solomayer E. *Osteopathy for Endometriosis and Chronic Pelvic Pain - a Pilot Study.* Geburtshilfe Frauenheilkd. 2016 Sep; 76(9):960-963. [PS](#)

Pelvic pain is a common problem in gynaecological practice. It is often unclear whether definite causality exists between reported symptoms and objective clinical findings of the female genital tract, and medical or operative treatments do not always achieve long-term resolution of symptoms.

This pilot study investigated 28 patients (age 20-65, median 36.5 years) from a gynaecology practice whose only clinical finding was painful pelvic floor muscle tightness.

Following standardised gynaecological and physiotherapist examination, all patients received osteopathic treatment. Pain had been present for a median of 3 years (range 1 month to 20 years).

14 patients had previously confirmed endometriosis.

22 of the 28 participants completed the treatment according to plan. Overall, 17 reported symptom improvement, while 10 of the 14 patients with endometriosis did.

Osteopathy is well received by women with painful pelvic floor muscle tightness and appears to be an effective treatment option.

Dobson D, Lucassen PL, Miller JJ, Vlieger AM, Prescott P, Lewith G. *Manipulative therapies for infantile colic.* Cochrane Database Syst Rev. 2012 Dec 12; 12:CD004796. [LR](#)

Infantile colic is a common disorder, affecting around one in six families, and in 2001 was reported to cost the UK National Health Service in excess of £65 million per year (Morris2001). Although it usually remits by six months of age, there is some evidence of longer-term sequelae



for both children and parents. Manipulative therapies, such as chiropractic and osteopathy, have been suggested as interventions to reduce the severity of symptoms.

To evaluate the results of studies designed to address efficacy or effectiveness of manipulative therapies (specifically, chiropractic, osteopathy and cranial manipulation) for infantile colic in infants less than six months of age, the following databases were searched: CENTRAL (2012, Issue 4), MEDLINE (1948 to April Week 3 2012), EMBASE (1980 to 2012 Week 17), CINAHL (1938 to April 2012), PsycINFO (1806 to April 2012), Science Citation Index (1970 to April 2012), Social Science Citation Index (1970 to April 2012), Conference Proceedings Citation Index - Science (1990 to April 2012) and Conference Proceedings Citation Index - Social Science & Humanities (1970 to April 2012).

Randomised trials evaluating the effect of chiropractic, osteopathy or cranial osteopathy alone or in conjunction with other interventions for the treatment of infantile colic were used for the study.

In pairs, five of the review authors were assessed according to:

- › eligibility of studies against the inclusion criteria,
- › extracted data from the included studies,
- › the risk of bias for all included studies.

Each article or study was assessed independently by two review authors. One review author entered the data into Review Manager software and the team's statistician (PP) reviewed the chosen analytical settings.

Six studies were identified for inclusion in the review, representing a total of 325 infants.

There were three further studies for which no information was found and three other ongoing studies were identified. Of the six included studies, five were suggestive of a beneficial effect and one found no evidence that manipulative therapies had any beneficial effect on the natural course of infantile colic. Tests for heterogeneity imply that there may be some underlying difference between this study and the other five.

Five studies measured daily hours of crying and these data were combined, suggesting that manipulative therapies had a significant effect on infant colic - reducing average crying time by one hour and 12 minutes per day (mean difference (MD) -1.20; 95% confidence interval (CI) -1.89 to -0.51).

This conclusion is sustained even when considering only studies with a low risk of selection bias (sequence generation and allocation concealment) (MD -1.24; 95% CI -2.16 to -0.33); those with a low risk of attrition bias (MD -1.95; 95% CI -2.96 to -0.94), or only those studies that have been published in the peer-reviewed literature (MD -1.01; 95% CI -1.78 to -0.24). However, when combining only those studies with a low risk of performance bias (parental 'blinding'), the improvement in daily crying hours was not statistically significant (MD -0.57; 95% CI -2.24 to 1.09).

One study considered whether the reduction in crying time was clinically significant.



This found that a greater proportion of parents of infants receiving a manipulative therapy reported clinically significant improvements than did parents of those receiving no treatment (reduction in crying to less than two hours: odds ratio (OR) 6.33; 95% CI 1.54 to 26.00; more than 30% reduction in crying: OR 3.70; 95% CI 1.15 to 11.86).

Analysis of data from three studies that measured 'full recovery' from colic as reported by parents found that manipulative therapies did not result in significantly higher proportions of parents reporting recovery (OR 11.12; 95% CI 0.46 to 267.52). One study measured infant sleeping time and found manipulative therapy resulted in statistically significant improvement (MD 1.17; 95% CI 0.22 to 2.12).

The quality of the studies was variable. There was a generally low risk of selection bias but only two of the six studies were evaluated as being at low risk of performance bias, three at low risk of detection bias and one at low risk of attrition bias.

One of the studies recorded adverse events and none were encountered. However, with only a sample of 325 infants, there is too few data to reach any definitive conclusions about safety.

The studies included in this meta-analysis were generally small and methodologically prone to bias, which makes it impossible to arrive at a definitive conclusion about the effectiveness of manipulative therapies for infantile colic. The majority of the included trials appeared to indicate that the parents of infants receiving manipulative therapies reported fewer hours crying per day than parents whose infants did not, based on contemporaneous crying diaries, and this difference was statistically significant.

The trials also indicate that a greater proportion of those parents reported improvements that were clinically significant.

However, most studies had a high risk of performance bias due to the fact that the assessors (parents) were not blind to who had received the intervention.

When combining only those trials with a low risk of such performance bias, the results did not reach statistical significance. Further research is required where those assessing the treatment outcomes do not know whether or not the infant has received a manipulative therapy.

There are inadequate data to reach any definitive conclusions about the safety of these interventions.

Hayden C, Mullinger B. *A preliminary assessment of the impact of cranial osteopathy for the relief of infantile colic.* Complement Ther Clin Pract. 2009 Nov; 15(4):198-203. [BRCT](#)

In this open, controlled, prospective study, 28 infants with colic were randomized to either cranial osteopathic manipulation or no treatment; all were seen once weekly for 4 weeks.

Treatment varied according to individual findings, and administered by the same practitioner.

Parents recorded time spent crying, sleeping and being held/rocked on a 24-hour diary.



A progressive, highly significant reduction between weeks 1 and 4 in crying (hours/24 h) was detected ($P < 0.001$) in treated infants; similarly, there was a significant improvement in time spent sleeping ($P < 0.002$).

By contrast, no significant differences were detected in these variables for the control group.

Overall decline in crying was 63% and 23%, respectively, for treated and controls; improvement in sleeping was 11% and 2%. Treated infants also required less parental attention than the untreated group.

In conclusion, this preliminary study suggests that cranial osteopathic treatment can benefit infants with colic; a larger, double-blind study is warranted.

Oliva Pascual-Vaca Á, Punzano-Rodríguez R, Escribá-Astaburuaga P, Fernández-Domínguez JC, Ricard F, Franco-Sierra MA, Rodríguez-Blanco C. *Short-Term Changes in Algometry, Inclination, Stabilometry, and Urinary pH Analysis After a Thoracolumbar Junction Manipulation in Patients with Kidney Stones. J Altern Complement Med. 2017 Aug; 23(8):639-647. [BRCT*](#)*

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The goal was to determine the efficacy of a high-velocity low-amplitude manipulation of the thoracolumbar junction in different urologic and musculoskeletal parameters in subjects suffering from renal lithiasis.

Randomized, controlled blinded clinical study.

Performed in the Nephrology departments of two hospitals and one private consultancy of physiotherapy in Valencia (Spain).

Forty-six patients suffering from renal lithiasis.

The experimental group (EG, $n = 23$) received a spinal manipulation of the thoracolumbar junction, and the control group (CG, $n = 23$) received a placebo procedure.

Variables: pressure pain thresholds (PPTs) of both quadratus lumborum and spinous processes from T10 to L1, lumbar flexion range of motion, stabilometry, and urinary pH were measured before and immediately after the intervention.



A comparison between pre- and postintervention phases was performed and an analysis of variance for repeated measures using time (pre- and postintervention) as intrasubject variable and group (CG or EG) as intersubject variable.

Intragroup comparison showed a significant improvement for the EG in the lumbar flexion range of motion ($p < 0.001$) and in all the PPT ($p < 0.001$ in all cases). Between-group comparison showed significant changes in PPT in quadratus lumborum ($p < 0.001$), as well as in the spinous processes of all of the evaluated levels ($p < 0.05$). No changes in urinary pH were observed ($p = 0.419$).

Spinal manipulation of the thoracolumbar junction seems to be effective in short term to improve pain sensitivity, as well as to increase the lumbar spine flexion.

Tozzi P, Bongiorno D, Vitturini C. *Low back pain and kidney mobility: local osteopathic fascial manipulation decreases pain perception and improves renal mobility.* J Bodyw Mov Ther. 2012 Jul; 16(3):381-91. [BRCT](#)

The goal of this study was to calculate and compare a Kidney Mobility Score (KMS) in asymptomatic and Low Back Pain (LBP) individuals following an Osteopathic Fascial Manipulation (OFM), consisting of Still Technique (ST) and Fascial Unwinding (FU). And to evaluate 'if' and 'to what degree' pain perception may vary in patients with LBP, after OFM is applied.

101 asymptomatic people (F 30; M 71; mean age 38.9 ± 8) were evaluated by abdominal US screening. The distance between the superior renal pole of the right kidney and the ipsilateral diaphragmatic pillar was calculated in both maximal expiration (RdE) and maximal inspiration (RdI).

The mean of the RdE-RdI ratios provided a Kidney Mobility Score (KMS) in the cohort of asymptomatic people.

The same procedure was applied to 140 participants (F 66; M 74; mean age 39.3 ± 8) complaining of non-specific LBP: 109 of whom were randomly assigned to the Experimental group and 31 to the Control group. For both groups, a difference of RdE and RdI values was calculated ($RD = RdE - RdI$), before (RD-T0) and after (RD-T1) treatment was delivered, to assess the effective range of right kidney mobility.

A blind assessment of each patient was carried using US screening. Both groups completed a Short-Form McGill Pain Assessment Questionnaire (SF-MPQ) on the day of recruitment (SF-MPQ T0) as well as on the third day following treatment (SF-MPQ T1). An Osteopathic assessment of the thoraco-lumbo-pelvic region to all the Experimental participants was performed, in order to identify specific areas of major myofascial tension.

Each individual of the Experimental group received OFM by the same Osteopath who had previously assessed them. A placebo treatment was applied to the Control group for the equivalent amount of time.



The factorial ANOVA test showed a significant difference (p -value < 0.05) between KMS in asymptomatic individuals (1.92 mm, Std. Dev. 1.14) compared with the findings in patients with LBP (1.52 mm, Std. Dev. 0.79).

The ANOVA test at repeated measures showed a significant difference (p -value < 0.0001) between pre- to post-RD values of the Experimental group compared with those found in the Control.

A significant difference (p -value < 0.0001) between pre- to post-SF-MPQ results was found in the Experimental cohort compared with those obtained in the Control.

People with non-specific LBP present with a reduced range of kidney mobility compared to the findings in asymptomatic individuals. Osteopathic manipulation is shown to be an effective manual approach towards improvement of kidney mobility and reduction of pain perception over the short-term, in individuals with non-specific LBP.

da Silva RC, de Sá CC, Pascual-Vaca ÁO, de Souza Fontes LH, Herbella Fernandes FA, Dib RA, Blanco CR, Queiroz RA, Navarro-Rodriguez T. *Increase of lower esophageal sphincter pressure after osteopathic intervention on the diaphragm in patients with gastroesophageal reflux.* Dis Esophagus. 2013 Jul; 26(5):451-6. [BRCT*](#)

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The treatment of gastroesophageal reflux disease may be clinical or surgical. The clinical consists basically of the use of drugs; however, there are new techniques to complement this treatment, osteopathic intervention in the diaphragmatic muscle is one these.

The objective of the study is to compare pressure values in the examination of esophageal manometry of the lower esophageal sphincter (LES) before and immediately after osteopathic intervention in the diaphragm muscle.

Thirty-eight patients with gastroesophageal reflux disease - 16 submitted to sham technique and 22 submitted osteopathic technique - were randomly selected.

The average respiratory pressure (ARP) and the maximum expiratory pressure (MEP) of the LES were measured by manometry before and after osteopathic technique at the point of highest pressure.

Statistical analysis was performed using the Student's t-test and Mann-Whitney, and magnitude of the technique proposed was measured using the Cohen's index.

Statistically significant difference in the osteopathic technique was found in three out of four in relation to the group of patients who performed the sham technique for the following measures of LES pressure: ARP with $P= 0.027$. The MEP had no statistical difference ($P= 0.146$). The values of Cohen for the same measures were: ARP with $d= 0.80$ and MEP $d= 0.52$.



Osteopathic manipulative technique produces a positive increment in the LES region soon after its performance.

Attali TV, Bouchoucha M, Benamouzig R. *Treatment of refractory irritable bowel syndrome with visceral osteopathy: short-term and long-term results of a randomized trial.* J Dig Dis. 2013 Dec; 14(12):654-61. [BRCT](#)

In light of the low efficiency of available drugs in treating irritable bowel syndrome (IBS), there has been a growing interest in its alternative therapies.

The aim of this study was to evaluate the effectiveness of visceral osteopathy for IBS.

In total, 31 consecutive refractory IBS patients were prospectively included in a randomized, crossover placebo-controlled study. Qualitative evaluation of depression and four symptoms including constipation, diarrhea, abdominal distension and abdominal pain before and after each phase of the study were conducted using visual analogue scales, measures of rectal sensitivity and colonic transit time. One year after the study, the assessment of symptoms was performed again in all patients.

Visceral osteopathy was associated with a significant amelioration of self-reported diarrhea, abdominal distension and abdominal pain, while constipation did not change significantly after this therapy.

It was also associated with decreased rectal sensitivity, presenting as an increase in threshold volume, constant sensation volume and maximum tolerable volume ($P < 0.001$).

However, no significant evolution of rectal sensitivity was observed when patients underwent placebo manipulations.

Modifications of depression and total or segmental colonic transit time were not observed.

One year after the end of this trial, symptom scores of diarrhea, abdominal distension and abdominal pain were significantly lower than those at enrolment ($P < 0.05$).

This study suggests that visceral osteopathy improves short-term and long-term abdominal distension and pain, and also decreases rectal sensitivity in IBS patients.

McSweeney TP, Thomson OP, Johnston R. *The immediate effects of sigmoid colon manipulation on pressure pain thresholds in the lumbar spine.* J Bodyw Mov Ther. 2012 Oct.; 16(4):416-23. [BRCT](#)

Visceral manual therapy is increasingly used by UK osteopaths and manual therapists, but there is a paucity of research investigating its underlying mechanisms, and in particular in relation to hypoalgesia.

The aim of this study was to investigate the immediate effects of osteopathic visceral mobilisation on pressure pain thresholds.



A single-blinded, randomised, within subjects, repeated measures design was conducted on 15 asymptomatic subjects.

Pressure pain thresholds were measured at the L1 paraspinal musculature and 1st dorsal interossei before and after osteopathic visceral mobilisation of the sigmoid colon.

The results demonstrated a statistically significant improvement in pressure pain thresholds immediately after the intervention ($P < 0.001$). This effect was not observed to be systemic, affecting only the L1 paraspinal musculature.

This novel study provides new experimental evidence that visceral manual therapy can produce immediate hypoalgesia in somatic structures segmentally related to the organ being mobilised, in asymptomatic subjects.

Heineman K. *Osteopathic manipulative treatment in the management of biliary dyskinesia*. J Am Osteopath Assoc. 2014 Feb; 114(2):129-33. [CCS](#)

Biliary dyskinesia is a functional gastrointestinal disorder of the gallbladder and sphincter of Oddi.

Diagnosis is made on the basis of symptoms of biliary colic in the absence of cholelithiasis and gallbladder inflammation.

Palpatory findings of tissue texture changes at midthoracic levels (T6-T9) may correspond to visceral dysfunction related to the biliary system.

Osteopathic manipulative treatment (OMT) of the T6-T9 segments can remove the feedback related to the somatic component, thereby affecting nociceptive facilitation at the spinal level and allowing the body to restore autonomic balance.

Few reports in the current literature provide examples of treatment for patients with biliary dyskinesia using OMT.

The author describes the case of a 51-year-old woman who presented with symptoms consistent with biliary dyskinesia. Her biliary colic completely resolved after OMT.

Osteopathic evaluation and OMT should be considered a safe and effective option for conservative management of biliary dyskinesia.

Racca V, Bordoni B, Castiglioni P, Modica M, Ferratini M. *Osteopathic Manipulative Treatment Improves Heart Surgery Outcomes: A Randomized Controlled Trial*. Ann Thorac Surg. 2017 Jul; 104(1):145-152. [BRCT](#)

Controlling sternal pain after heart surgery is important to reduce the risk of postoperative complications, but pain is often undertreated because of contraindications and side effects of analgesic drugs. Recently, osteopathic manipulative treatment (OMT) was demonstrated to reduce pain in different clinical contexts, suggesting its potential utility after cardiac surgery.



The aim of this open-label, controlled study is to assess whether OMT contributes to sternal pain relief and improves postoperative outcomes.

Eighty post-sternotomy adult inpatients were randomly allocated one to one to receive a standardized cardiorespiratory rehabilitation program alone (control group) or combined with OMT.

Pain intensity and respiratory functional capacity were quantified by the Visual Analogue Scale score and by a standardized breathing test, at the start and end of rehabilitation.

At the start of rehabilitation, the control group and the OMT group had similar Visual Analogue Scale median scores (controls 4, interquartile range [IQR]: 2 to 5; OMT 4, IQR: 3 to 5; $p =$ not significant) and mean inspiratory volumes (controls 825 ± 381 mL; OMT 744 ± 291 mL; $p =$ not significant). At the end of rehabilitation, the OMT group had a lower Visual Analogue Scale median score (controls 3, IQR: 2 to 4; OMT 1, IQR: 1 to 2; $p < 0.01$) and higher mean inspiratory volume (controls $1,400 \pm 588$ mL; OMT $1,781 \pm 633$ mL; $p < 0.01$). The analgesic drug intake was similar in the two groups. The hospitalization was shorter in the OMT group than in the control group (19.1 ± 4.8 versus 21.7 ± 6.3 days; $p < 0.05$).

The combination of standard care with OMT is effective in inducing pain relief and functional recovery, and significantly improves the management of patients after heart surgery with sternotomy.

Wieting JM, Beal C, Roth GL, Gorbis S, Dillard L, Gilliland D, Rowan J. *The effect of osteopathic manipulative treatment on postoperative medical and functional recovery of coronary artery bypass graft patients.* J Am Osteopath Assoc. 2013 May; 113(5):384-93. [BRCT](#)

Several studies have investigated the use of osteopathic manipulative treatment (OMT) after coronary artery bypass graft (CABG) operations; however, there is little information regarding the effect of OMT in the postoperative recovery of patients undergoing CABG operations.

Patients scheduled to undergo a CABG operation were voluntarily enrolled and randomly assigned to receive 1 of 3 treatment protocols after their surgical procedure: standardized daily OMT and conventional postoperative care (the OMT group), daily time-matched placebo OMT and conventional postoperative care (the placebo group), or conventional postoperative care only (the control group). Specific OMT techniques used were thoracic inlet myofascial release, standard rib raising (with paraspinal muscle stretch to the L2 vertebral level), and soft tissue cervical paraspinal muscle stretch (with suboccipital muscle release). Primary outcome measures included time to discharge, time to postoperative bowel movement, and FIM functional assessment scores.

Fifty-three patients completed the study protocol: 17 in the OMT group, 18 in the placebo group, and 18 in the control group. After surgical procedures, patients were discharged to home at a mean (standard deviation [SD]) rate of 6.1 (1.4), 6.3 (1.5), and 6.7 (3.0) days for the OMT group, placebo group, and control group, respectively.



Patients in the OMT group were discharged 0.55 days earlier than those in the control group and 0.16 days earlier than those in the placebo group. The mean (SD) number of days to first postoperative bowel movement was 3.5 (0.9), 4.0 (0.8), and 4.0 (0.9) for the OMT group, the placebo group, and the control group, respectively.

On day 3 after surgery, the mean (SD) total score on the FIM was 19.3 (6.7), 15.4 (7.3), and 18.6 (6.5) for the OMT, the placebo, and the control group, respectively; total score for the OMT group was 0.81 greater than that of the control group and 3.87 greater than that of the placebo group.

None of the differences achieved statistical significance ($P < .05$).

A daily postoperative OMT protocol improved functional recovery of patients who underwent a CABG operation.

Spiegel AJ, Capobianco JD, Kruger A, Spinner WD. *Osteopathic manipulative medicine in the treatment of hypertension: an alternative, conventional approach.* Heart Dis. 2003 Jul-Aug; 5(4):272-8. [LR](#)

Although osteopathic physicians are taught to incorporate OMM into the management of medical disorders, the usefulness of OMM in treating hypertension is less clear.

This review reflects on the past 90 years of biomedical literature and attempts to address the utility of OMM used alone, or in combination with other treatments including antihypertensive medication, for the effective management of hypertension.

Preliminary evidence may suggest a role for OMM in treating hypertension within the context of a multifaceted and long-lasting treatment regimen that may include traditional pharmacotherapeutics.

To have universal acceptance, controlled and blinded outcome studies are needed to determine the effectiveness of OMM for the routine treatment of hypertension.

Noll DR, Degenhardt BF, Johnson JC. *Multicenter Osteopathic Pneumonia Study in the Elderly: Subgroup Analysis on Hospital Length of Stay, Ventilator-Dependent Respiratory Failure Rate, and In-hospital Mortality Rate.* J Am Osteopath Assoc. 2016 Sep 1; 116(9):574-87. [BRCT](#)

Osteopathic manipulative treatment (OMT) is a promising adjunctive treatment for older adults hospitalized for pneumonia.

A multicenter randomized controlled trial was performed in seven community hospitals.

Three hundred eighty-seven patients aged 50 years or older who met specific criteria for pneumonia on hospital admission.



Participants were randomly assigned to 1 of 3 groups that received an adjunctive OMT protocol (n=130), a light touch (LT) protocol (n=124), or conventional care only (CCO) (n=133).

Outcomes for subgroup analyses were LOS, ventilator-dependent respiratory failure rate, and in-hospital mortality rate. Subgroups were age (50-74 years or ≥ 75 years), Pneumonia Severity Index (PSI) class (I-II, III, IV, or V), and type of pneumonia (community-acquired or nursing-home acquired).

Data were analyzed by intention-to-treat and per-protocol analyses using stratified Cox proportional hazards models and Cochran-Mantel-Haenszel tests for general association.

By per-protocol analysis of the younger age subgroup, LOS was shorter for the OMT group (median, 2.9 days; n=43) than the LT (median, 3.7 days; n=45) and CCO (median, 4.0 days; n=65) groups (P=.006).

By intention-to-treat analysis of the older age subgroup, in-hospital mortality rates were lower for the OMT (1 of 66 [2%]) and LT (2 of 68 [3%]) groups than the CCO group (9 of 67 [13%]) (P=.005).

By per-protocol analysis of the PSI class IV subgroup, the OMT group had a shorter LOS than the CCO group (median, 3.8 days [n=40] vs 5.0 days [n=50]; P=.01) and a lower ventilator-dependent respiratory failure rate than the CCO group (0 of 40 [0%] vs 5 of 50 [10%]; P=.05).

By intention-to-treat analysis, in-hospital mortality rates in the PSI class V subgroup were lower (P=.05) for the OMT group (1 of 22 [5%]) than the CCO group (6 of 19 [32%]) but not the LT group (2 of 15 [13%]).

Subgroup analyses suggested adjunctive OMT for pneumonia reduced LOS in adults aged 50 to 74 years and lowered in-hospital mortality rates in adults aged 75 years or older.

Adjunctive OMT may also reduce LOS and in-hospital mortality rates in older adults with more severe pneumonia. Interestingly, LT also reduced in-hospital mortality rates in adults aged 75 years or older relative to CCO.

Swender DA, Thompson G, Schneider K, McCoy K, Patel A. *Osteopathic manipulative treatment for inpatients with pulmonary exacerbations of cystic fibrosis: effects on spirometry findings and patient assessments of breathing, anxiety, and pain.* J Am Osteopath Assoc. 2014 Jun; 114(6):450-8. [BRCT](#)

Osteopathic manipulative treatment (OMT) has been studied in patients with various respiratory diseases. However, to the authors' knowledge, no studies have assessed the efficacy of OMT in patients with cystic fibrosis (CF).

The goal was to evaluate pulmonary function and perceptions of breathing, anxiety, and pain of CF patients who receive OMT in addition to standard inpatient management of pulmonary exacerbation.



In a single-blind randomized controlled trial, we assessed adult patients with a history of CF who were admitted to the hospital because of pulmonary exacerbation. Participants were randomly assigned to receive a daily standardized protocol of OMT or sham therapy. Both groups also received standard treatment for CF. Spirometry and questionnaire data (self-assessment of breathing, pain, and anxiety level) were collected before the first OMT or sham therapy session and after the final session.

A total of 33 patients were included in the study: 16 in the OMT group and 17 in the sham therapy group. Improvements in spirometric parameters were observed in both the OMT and the sham therapy groups, with no statistically significant differences found between the groups.

More patients in the OMT group than in the sham therapy group had questionnaire response patterns that indicated their breathing had improved during the study period (15 of 16 vs 8 of 16, respectively). No differences were found between groups for perceived improvement of pain and anxiety.

In the current study, CF patients who received OMT did not demonstrate statistically significant differences in pre- and posttreatment spirometry findings compared with CF patients who received sham therapy. Questionnaire findings suggest that OMT may affect CF patients' perception of overall quality of breathing. Additional studies are needed to assess the clinical use of OMT in patients with CF.

Zanotti E, Berardinelli P, Bizzarri C, Civardi A, Manstretta A, Rossetti S, Fracchia C. *Osteopathic manipulative treatment effectiveness in severe chronic obstructive pulmonary disease: a pilot study.* Complement Ther Med. 2012 Feb-Apr; 20(1-2):16-22. [BRCT](#)

Few and contrastingly data are available about use of osteopathic manipulative treatment (OMT) in patients with chronic obstructive pulmonary disease (COPD).

The aim of the study is to compare the effects of the combination of pulmonary rehabilitation and OMT compared with pulmonary rehabilitation (PR) in patients with severely impaired COPD.

Exercise capacity through 6 min walk test (6MWT--primary outcome) and pulmonary function test (secondary outcomes) were evaluated at the beginning and at the end of the training. Patients were randomly assigned to receive PR + soft manipulation (G1) or OMT+PR (G2) for 5 days/week for 4 weeks.

20 stable COPD patients (5 female--mean age, 63.8±5.1 years; FEV1 26.9±6.3% of predicted) were evaluated. Respect to the baseline, 6 MWT statistically improved in both group. In particular, G2 group gained 72.5±7.5 m (p=0.01) and G1 group 23.7±9.7 m. Between group comparison showed a difference of 48.8 m (95% CI: 17 to 80.6 m, p=0.04). Moreover, in G2 group we showed a decrease in residual volume (RV--from 4.4±1.5 l to 3.9±1.5 l, p=0.05). Between group comparison showed an important difference (-0.44 l; 95% CI: -0.26 to -0.62 l, p=0.001). Furthermore, only in G2 group we showed an increase in FEV1.



This study suggests that OMT+PR may improve exercise capacity and reduce RV in severely impaired COPD patients with respect to PR alone.

Noll DR, Degenhardt BF, Johnson JC, Burt SA. *Immediate effects of osteopathic manipulative treatment in elderly patients with chronic obstructive pulmonary disease.* J Am Osteopath Assoc. 2008 May; 108(5):251-9. [BRCT](#)

Osteopathic manipulative treatment (OMT) has long been advocated for patients with respiratory disorders, but little definitive evidence exists to support its use in this population.

The objective of this study was to investigate the immediate effect of OMT on pulmonary function parameters in subjects aged 65 years or older with chronic obstructive pulmonary disease with a forced vital capacity ratio of less than 70%. Subjects were recruited and randomly assigned to receive either OMT or sham therapy. The OMT protocol consisted of seven standardized osteopathic manipulative techniques, while the sham therapy protocol comprised light touch applied to the same anatomic regions and for the same duration (20 min). All subjects received baseline and post-treatment pulmonary function testing.

Of the 35 study participants, 18 were randomly assigned to the OMT group and 17 to the sham group. Compared with the sham group, the OMT group showed a statistically significant decrease in the forced expiratory flow at 25% and 50% of vital capacity and at the midexpiratory phase; the expiratory reserve volume; and airway resistance. The OMT group also had a statistically significant increase in the residual volume, total lung capacity, and the ratio of those values compared with the sham group. Most subjects (82%, OMT group; 65%, sham group) reported breathing better after receiving their treatment. Only 53% of subjects in the OMT group and 41% in the sham group correctly guessed their group assignment.

Guiney PA, Chou R, Vianna A, Lovenheim J. *Effects of osteopathic manipulative treatment on pediatric patients with asthma: a randomized controlled trial.* J Am Osteopath Assoc. 2005 Jan; 105(1):7-12. [BRCT](#)

Asthma is a common chronic condition that has long plagued the pediatric patient population.

Asthma in children can cause excessive school absenteeism, hospitalizations, and even death.

Osteopathic manipulative treatment (OMT) is an underutilized non-invasive treatment method for patients with asthma.

The use of OMT may help decrease mortality and morbidity rates among this patient group.

The authors conducted a randomized controlled trial attempting to demonstrate the therapeutic relevance of OMT in the pediatric asthma population.

With a confidence level of 95%, results for the OMT group showed a statistically significant improvement of 7 L per minute to 9 L per minute for peak expiratory flow rates.

These results suggest that OMT has a therapeutic effect among this patient population.



The authors suggest that more clinical trials are required to better demonstrate the effectiveness of OMT in patients with asthma.

Bockenbauer SE, Julliard KN, Lo KS, Huang E, Sheth AM. *Quantifiable effects of osteopathic manipulative techniques on patients with chronic asthma. J Am Osteopath Assoc. 2002 Jul; 102(7):371-5; discussion 375. [PS](#)*

In this pilot study, the authors evaluated the immediate effects of osteopathic manipulative procedures compared with sham procedures on 10 subjects who were diagnosed with chronic asthma.

The research followed a pre-test/post-test crossover design wherein each subject served as her own control.

Blinded examiners recorded respiratory excursion, peak expiratory flow rates, and subjective measures of asthma symptoms.

Measurements of both upper thoracic and lower thoracic forced respiratory excursion statistically increased after osteopathic manipulative procedures compared with sham procedures.

Changes in peak expiratory flow rates and asthma symptoms were not statistically significant.

Rowane WA, Rowane MP. *An osteopathic approach to asthma. J Am Osteopath Assoc. 1999 May; 99(5):259-64. [LR](#)*

Five areas involving asthma management are reviewed and involve a failure to do the following:

- › identify disease instability and progression
- › adopt an optimal pharmacologic treatment plan
- › identify and help the patient avoid environmental triggers
- › evaluate and treat certain disruptive psychodynamic issues
- › use essential non-pharmacologic modes of therapy such as osteopathic manipulation, nutritional considerations, physical training, and controlled breathing techniques that may help to favourably modify the asthma disease process.

Sleszynski SL, Kelso AF. *Comparison of thoracic manipulation with incentive spirometry in preventing postoperative atelectasis. J Am Osteopath Assoc. 1993 Aug; 93(8):834-8, 843-5. [BRCT](#)*

Atelectasis is a preventable complication that often occurs after upper abdominal surgery.

In our 1-year randomized, researcher-blinded trial, low-risk cholecystectomy patients were subjected to either the thoracic lymphatic pump (n = 21) or incentive spirometry (n = 21) to prevent atelectasis.



The treatment groups were equal with respect to risk factors for atelectasis and deviation of preoperative respiratory parameters (forced vital capacity [FVC] and forced expiratory volume in one second [FEV1]) from the predicted values.

Atelectasis occurred in 2 (5%) of 21 patients regardless of whether incentive spirometry or thoracic lymphatic pump treatment was used.

Study patients treated with the thoracic lymphatic pump technique had an earlier recovery and quicker return toward preoperative values for FVC and FEV1 than patients treated with incentive spirometry.

Ruffini N, D'Alessandro G, Cardinali L, Frondaroli F, Cerritelli F. *Osteopathic manipulative treatment in gynecology and obstetrics: A systematic review. Complement Ther Med.* 2016 Jun; 26:72-8. [LR](#)

The aim of the review was to evaluate the effects of the osteopathic manipulative treatment (OMT) on women with gynaecological and obstetric disorders.

An extensive search from inception to April 2014 was conducted on MEDLINE, Embase, the Cochrane library using MeSH and free terms. Clinical studies investigating the effect of OMT in gynaecologic and obstetric conditions were included as well as unpublished works. Reviews and personal contributions were excluded. Studies were screened for population, outcome, results and adverse effects by two independent reviewers using an ad-hoc data extraction form. The high heterogeneity of the studies led to a narrative review.

24 studies were included (total sample=1840), addressing back pain and low back functioning in pregnancy, pain and drug use during labor and delivery, infertility and subfertility, dysmenorrhea, symptoms of (peri)menopause and pelvic pain. Overall, OMT can be considered effective on pregnancy related back pain but uncertain in all other gynaecological and obstetrical conditions.

Only three studies (12.5%) mentioned adverse events after OMT.

Although positive effects were found, the heterogeneity of study designs, the low number of studies and the high risk of bias of included trials prevented any indication on the effect of osteopathic care.

Further investigation with more pragmatic methodology, better and detailed description of interventions and systematic reporting of adverse events are recommended in order to obtain solid and generalizable results.

Hodge LM. *Osteopathic lymphatic pump techniques to enhance immunity and treat pneumonia.* Int J Osteopath Med. 2012 Mar; 15(1):13-21. [LR](#)

Pneumonia is a common cause of morbidity and mortality worldwide. While antibiotics are generally effective for the treatment of infection, the emergence of resistant strains of bacteria threatens their success.



The osteopathic medical profession has designed a set of manipulative techniques called lymphatic pump techniques (LPT), to enhance the flow of lymph through the lymphatic system.

Clinically, LPT is used to treat infection and oedema and might be an effective adjuvant therapy in patients with pneumonia.

The immune system uses the lymphatic and blood systems to survey to rid the body of pathogens; however, only recently have the effects of LPT on the lymphatic and immune systems been investigated.

This short review highlights clinical and basic science research studies that support the use of LPT to enhance the lymphatic and immune systems and treat pneumonia, and discusses the potential mechanisms by which LPT benefits patients with pneumonia.

Creasy C, Schander A, Orlowski A, Hodge LM. *Thoracic and abdominal lymphatic pump techniques inhibit the growth of *S. pneumoniae* bacteria in the lungs of rats.* *Lymphat Res Biol.* 2013 Sep; 11(3):183-6. [BRCT](#)

Osteopathic physicians utilize manual medicine techniques called lymphatic pump techniques (LPT) to improve lymphatic flow and enhance immunity. Clinical studies report that LPT enhances antibody responses to bacterial vaccines, shortens duration of cough in patients with respiratory disease, and shortens the duration of intravenous antibiotic therapy and hospital stay in patients with pneumonia. The purpose of this study was to identify if thoracic LPT (Th-LPT) or abdominal LPT (Ab-LPT) would reduce *Streptococcus pneumoniae* colony-forming units (CFU) in the lungs of rats with acute pneumonia.

Rats were nasally infected with *S. pneumoniae* and received either control, sham, Ab-LPT, or Th-LPT once daily for 3 consecutive days. On day 4 post-infection, lungs were removed and bacteria were enumerated. Three daily applications of either Ab-LPT or Th-LPT were able to significantly ($p < 0.05$) reduce the numbers of pulmonary bacteria compared to control and sham. There were no significant differences in the percentage or concentration of leukocytes in blood between groups, suggesting neither Ab-LPT nor Th-LPT release leukocytes into blood circulation.

Our data demonstrate that LPT may protect against pneumonia by inhibiting bacterial growth in the lung; however, the mechanism of protection is unclear. Once these mechanisms are understood, LPT can be optimally applied to patients with pneumonia, which may substantially reduce morbidity, mortality, and frequency of hospitalization.

de Almeida BS, Sabatino JH, Giraldo PC. *Effects of high-velocity, low-amplitude spinal manipulation on strength and the basal tonus of female pelvic floor muscles.* *J Manipulativa Physiol Ther.* 2010 Feb; 33(2):109-16. [NCES*](#)

Spinal manipulation with high-velocity and low-amplitude (HVLA) manipulation is frequently used for the treatment of lumbopelvic pain; however, the effect on the pelvic floor has been



poorly studied in the past. The objective of this study was to quantify the intravaginal pressure (IVP) and the basal perineal tonus (BPT), measured in terms of pressure, before and after the HVLA manipulation in patients without neuromuscular and skeletal dysfunctions.

In this experimental, non-controlled, non-randomized study, IVP was obtained through a perineometer introduced into the volunteers' vagina while in dorsal horizontal decubitus.

Forty young, healthy university volunteer women with no history of vaginal delivery participated.

All voluntary contractions of the perineal muscles were measured in 3 different ways: phasic perineal contraction (PPC), tonic perineal contraction, and perineal contraction associated to accessory muscles. New pressure measurements were obtained immediately after the HVLA manipulation on the volunteers' sacrum. The pressures were registered and transcribed directly to a personal computer with specific software.

The average IVPs obtained in millimeters of mercury before and after the HVLA manipulation were 56.01 (+/-25.54) and 64.65 (+/-25.63) for PPC, 445.90 (+/-186.84) and 483.14 (+/-175.29) for tonic perineal contraction, and 65.62 (+/-26.56) and 69.37 (+/-25.26) for perineal contraction associated to accessory muscles, respectively. There was significant statistical variation only for PPC ($P = .0020$) values. The BPT increased regardless of the type of contraction ($P < .05$).

High-velocity and low-amplitude manipulation of the sacrum was associated with an increase of PPC and of BPT in women who had no associated osteoarticular diseases. These preliminary discoveries could be helpful in the future study of the treatment of women with perineal hypotony.



SCIENTIFIC ARTICLES ON VISCERAL OSTEOPATHY PUBLISHED BETWEEN 1999 AND 2017

ARTICLES ON OSTEOPATHY AND THE GASTROINTESTINAL SYSTEM

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Müller et al. (2014)	LR	Irritable Bowel Syndrome.	204
Daraï et al. (2017)	BRCT	Bowel endometriosis.	46
Dobson et al. (2012)	LR	Infantile colic.	325
Hayden et al. (2009)	BRCT	Infantile colic.	28
Oliva Pascual-Vaca et al. (2013)	BRCT	Gastro-oesophageal reflux disease.	38
Attali et al. (2013)	BRCT	Irritable Bowel Syndrome.	31
McSweeney et al. (2012)	RCT	Pressure Pain Threshold and mobilization of the sigmoid colon.	15
Heineman (2014)	CC	Biliary dyskinesia.	1

LR = Literature Review, CC = Clinical Case Study, BRCT = Blinded Randomised Controlled Trial, PS = Pilot Study.

ARTICLES ON OSTEOPATHY AND THE UROGENITAL SYSTEM

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Franke et al. (2013)	LR	Lower urinary tract diseases.	
Goyal et al. (2017)	CC	Uterine bleeding, chronic pelvic pain, endometriosis.	29
Sillem et al. (2016)	PS	Pelvic pain, painful pelvic floor muscle tightness.	28
Oliva Pascual-Vaca et al. (2017)	BRCT	Renal lithiasis.	46
Tozzi et al. (2012)	BRCT	Low back pain and kidney mobility through ultrasound investigation.	101
Ruffini et al. (2016)	LR	Gynaecological and obstetric disorders.	1,840
de Almeida et al. (2010)	NCES	Intravaginal pressure and perineal muscle tone.	40

LR = Literature Review, CC = Clinical Case Study, BRCT = Blinded Randomised Controlled Trial, PS = Pilot Study, NCES = Non Controlled Experimental Study



ARTICLES ON OSTEOPATHY AND CARDIALGIA

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Racca et al. (2017)	BRCT	Sternal pain after heart surgery.	
Wieting et al. (2013)	BRCT	Coronary artery bypass surgery.	53
Spiegel et al. (2003)	LR	AHT.	

LR = Literature Review, CC = Clinical Case Study, BRCT = Blinded Randomised Controlled Trial, PS = Pilot Study.

ARTICLES ON OSTEOPATHY AND PULMONOLOGY

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Noll et al. (2016)	BRCT	Pneumonia.	387
Swender et al. (2014)	BRCT	Mucoviscidosis.	33
Zanotti et al. (2012)	BRCT	Chronic obstructive pulmonary disease.	20
Noll et al. (2008)	BRCT	Chronic obstructive broncho-pneumopathy.	35
Guiney et al. (2005)	BRCT	Asthma.	
Bockenbauer et al. (2002)	PS	Chronic asthma.	10
Rowane et al. (1999)	LR	Asthma.	
Sleszynski and Kelso (1993)	BRCT	Atelectasis.	42
Hodge (2012)	LR	Pneumonia.	
Creasy et al. (2013)	BRCT	Pneumonia.	Rats

LR = Literature Review, CC = Clinical Case Study, BRCT = Blinded Randomised Controlled Trial, PS = Pilot Study.

THESES ON VISCERAL OSTEOPATHY

Morán Benito M.C, Calvente Marín R. *Cambios en la presión arterial y frecuencia cardíaca después de una presión sobre la válvula aórtica en sujetos con hipertensión arterial esencial. (Changes in blood pressure and heart rate when pressure is applied to the aortic valve in patients with essential hypertension)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2008. [BRCT](#)

Arterial hypertension is persistently elevated blood pressure in the arteries and is one of the most common chronic illnesses worldwide.

The aim of this study is to objectively determine whether or not pressure maintained for 90 seconds on the estimated location of the aortic valve on the sternum produces changes in blood pressure and heart rate in patients with essential hypertension.

The study was performed on 70 subjects with essential hypertension, being treated with angiotensin-converting-enzyme (ACE) inhibitors only. The sample was randomly divided into two groups: we applied pressure on the aortic valve for 90 seconds in the study group and allocated expectant management to the control group.

In order to carry out this study, the researchers used a piece of apparatus, which they named the “Somial” (an abbreviation of the Spanish words for a support, a microphone and a pressure algometer), designed specifically for the study.

The following parameters were used to measure the subjects’ response to the method applied:

Systolic arterial blood pressure, diastolic arterial blood pressure and heart rate. These were measured in both groups before, just after and 20 minutes after applying the pressure to the sternum.

It was observed that a significant decrease in systolic arterial blood pressure (7.4/9mmHg) was more likely to occur in patients in the study group than the control group, although this tendency was not deemed to be significant.

Changes in blood pressure and heart rate when pressure is applied to the aortic valve in patients with essential hypertension.

Patients with hypertension tend to experience a homogeneous decrease in systolic arterial blood pressure as a result of pressure applied to the aortic valve for 90 seconds.

Marquez Ambite J.J, Cortijo Sánchez C. *Efectividad de la técnica de estiramiento del diafragma objetivada con cardiografía de tórax. (The effectiveness of applying a targeted stretching technique to the diaphragm with a cardiograph of the chest)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2005. [BRCT](#)

Introduction

The diaphragm plays a vital role in the body, with multiple anatomic connections and is therefore frequently the focus of osteopathic manipulative treatment, irrespective of the pathology. For that reason, it is essential that we know how effective osteopathic techniques are on the diaphragm

Objectives

The aim of this study is to evaluate the effectiveness of the stretching technique on the diaphragm, observing changes in the elevation of the diaphragm in maximum exhalation.

The study was performed on 65 subjects with no known uncontrolled pathologies, with a simple random sample, not discriminating against any individual on the basis of their condition.

Each of the subjects was random assigned to either the experimental group or the control group for comparison.

The following apparatus was used for this study: an X-Ray generator, a lift table, a vertical Bucky and a developer with a 35 × 43 frame.

X-rays were taken before and after performing the technique (the experimental group) or before and after 10 spontaneous breaths (the control group). The distance from a fixed internal reference point to the left and right cupolae of the diaphragm was measure on the X-rays from both before and after and the difference between the two measurements represents the elevation of the diaphragm.

Statistically significant ($p < 0.001$) differences were found between the experimental and control groups when the X-rays were compared. No relationship was found between these variables and the other anthropometric, descriptive and pathological variables measured as part of this study.

The stretching technique is effective and produces an elevation of the diaphragm.



Oscos Muñoa G., Lillo de la Quintana M.C. *Influencia de la técnica de stretching de la parte anterior del diafragma en los valores espirométricos en fumadores. (The effect of applying the stretching technique to the anterior part of the diaphragm on spirometry tests in smokers)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2005. [BRCT](#)

The objective of this study, performed on 60 subjects, was to identify the effect of applying the stretching technique to the anterior part of the diaphragm on spirometry tests in smokers.

The study consisted of a clinical trial performed on an experimental group and a control group.

When analysing the data, the t-test (mean difference) and ANOVA-MANOVA were used to test the principle hypotheses, observing interaction between certain variables and treatment. Significant positive differences were observed after performing Forced Vital Capacity, Expiratory Flow in the first second and Peak Expiratory Flow tests.

It was concluded that the technique can be applied as part of treatment for this health issue.

Furthermore, interactions were found between treatment and variables such as sex, age, weight and size.

Baño Alcaraz A. *Variaciones espirométricas en pacientes fumadores tras la técnica de manipulación de la base del pulmón. (Spirometric variations in smokers following the application of osteopathic manipulative techniques on the base of the lung)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2011. [BRCT](#)

Tobacco consumption is a global public health issue. Smoking affects pulmonary ventilation. Smoking is associated with decreased lung capacity in particular, a significant annual decrease in FEV1- 25ml/ year in non-smokers and 40ml/ year in smokers.

Osteopathic Manipulative Techniques (OMT) are taught as a method of increasing vital capacity and the mobility of the rib cage.

A double-blinded randomized study on the effect of visceral manipulation techniques applied to the base of the lung in patients who have been smoking for 2 years or more. The patients were randomly distributed into two groups: Group A (experimental group) and Group B (control group) and underwent a spirometry test before and after the application of the technique to reveal any detectable changes in FEV, FEV1, PEF AND FEF25-75. The sample size was 64 patients, 31 of which were men (48.4%) and 33 of which were women (51.6%).

Statistical tests such as the Mann–Whitney U Test were used, following the application of the Kolmogorov–Smirnov Test.

The results obtained indicate that there were statistically significant ($p < 0.05$) variations in the PEF Peak Expiratory Flow ($P = 0.010$) and FEF25-75 small airways ($P = 0.034$) between



Group A and Group B following the application of osteopathic manipulative techniques to the base of the lung.

Osteopathic manipulative techniques applied bilaterally to the base of the lung in smokers produces spirometric variations in the variables Peak Expiratory Flow (PEF) and Forced Expiratory Flow (FEF25-75%).

Moro Pantoja A. *Efectos inmediatos de la técnica de músculo energía aplicada en el segmento C7-T1 sobre la frecuencia cardíaca de los pacientes hipertensos. Ensayo clínico aleatorizado. (The immediate effects of the muscle energy technique applied to the C7-T1 segment on heart rate in hypertense patients. Randomized clinical trial).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2014. [BRCT](#)

Arterial Hypertension (AHT) is a growing disease in Spain. Its prevalence among the adult Spanish population is 35%. This figure increases with age and reaches 68% in adults aged 60 or above, making AHT a serious public health issue.

The objectives of this study were:

- › to find out the immediate effect of the muscle energy technique applied to the C7-T1 vertebral segment on heart rate in subjects with arterial hypertension.
- › to determine whether it is safe to apply the muscle energy technique to the C7-T1 vertebral segment.

Randomized clinical trial (RCT), experimental, blinded and controlled. Sixty one (n=61) patients with hypertension were randomly distributed into two groups: an experimental group (n=31) and a control group (n=30). An initial assessment (pre-intervention) and a final assessment (post-intervention) were carried out, analysing changes in heart rate. The tests used were the Mitchell, Jackson and Klein tests. The intervention used for the study was muscle energy technique, applied to the C7-T1 vertebral segment for osteopathic spinal dysfunctions in ERS and FRS.

The result of the study was that it is safe to apply the muscle energy technique to the cervical segment in patients with arterial hypertension.

It is safe to apply the muscle energy technique to the C7-T1 vertebral segment.

Martínez Fernández JA. *Influencia de la técnica de thumb-move sobre los volúmenes respiratorios en sujetos que padecen asma intrínseca. (The effect of the thumb move technique on respiratory volumes in patients with intrinsic asthma).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2011. [BRCT](#)

The objective of this study was to observe any changes in various spirometric parameters in asthmatic subjects that occur as a result of applying a high-velocity, low-amplitude osteopathic



technique (HVLA) bilaterally to the cervicothoracic junction in the spine; taking age, gender, body mass index, activity levels and tobacco consumption into account.

To that end, a randomized, controlled experimental study was carried out on forty subjects, twenty men and twenty women, who suffer from intrinsic asthma, diagnosed by a qualified medical professional. The subjects were aged between 20 and 49, with an average age of 32. The subjects were evenly distributed into two groups: 20 subjects were assigned to the intervention (experimental) group and 20 were assigned to the control group.

The general descriptive statistics were analysed, studying the degree of significance in the differences found, using the parametric student's t-test and the non-parametric Mann-Whitney U test. As part of the statistical analysis, the differences observed in a series of tests such as Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1) and Peak Expiratory Flow (PEF) were compared. Each of the parameters was measured in all of the subjects while resting and then, in the experimental group only, at 1 minute, 5 minutes, 15 minutes and 72 hours after the bilateral application of the thrust technique in the cervicothoracic region. The same measurements were taken from the control group at the same time intervals but without applying the thrust technique.

No statistically significant changes in lung volumes were observed after applying the manoeuvre.

There were also no differences between the two groups.

The results showed no statistically significant changes between the two groups studied, although some clinical improvement was seen in the experimental group, compared to the control group.

de Sousa LA. *Modificaciones de los niveles de amoníaco sérico después aplicación de técnica osteopática del hígado. (Changes in levels of ammonia after applying osteopathic manipulative techniques to the liver).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2009. [BRCT](#)

The objective of this study was to demonstrate that the Liver Pump Technique (Ralph Faylor) will not affect the level of ammonia in patients with levels higher than 45 micromol/L, which is considered normal according to the protocol of existing tests.

A randomized simple blind controlled experimental clinical trial was carried out on 31 patients with ammonia levels higher than 45 micromol/L, with no diagnosed acute visceral pathologies, not suffering from cancer or any other pathology as these are contraindications to the proposed treatment. The subjects were divided into two groups, an experimental group of 16 patients over the age of 18 (3 men- non-smokers, 13 women- smokers) and a control group of 15 patients over the age of 18 (4 men- smokers and 11 women- smokers). The clinical profiles of the patients in both the experimental and the control groups included: myofascial pain syndrome, polyarthralgia, fibromyalgia and work-related musculoskeletal disorders.

The levels of ammonia were measured in both groups at 5 intervals after the application of the osteopathic manipulative technique to the liver: Test 1: before the 1st intervention, Test 2:



7-10 minutes after the 1st intervention, Test 3: 24 hours after the 1st intervention, Test 4: 7 days after the 1st intervention and Test 5: 7-10 minutes after the 4th intervention (1 intervention was performed every week), according to the predetermined protocol.

A total of 155 blood tests were carried out across the two groups, as described in the predetermined protocol. After statistical analysis, it was shown that the Liver Pump Technique and/or simulation of the technique (Ralph Faylor) did not affect levels of ammonia in the blood ($p > 0.05$), except at isolated points in the study. The levels of ammonia were not affected and there was no statistically significant tendency ($p \leq 0.05$) for them to fall below the normal level of 45 micromol/L.

The Liver Pump Technique (Ralph Faylor) applied to patients with levels of ammonia higher than 45 micromol/L did not serve to regulate the levels of ammonia in their blood.

Vecino Rodriguez A. *Modificaciones inmediatas en la dinámica uterina tras la realización de la técnica modificada de equilibración de la sincondrosis esfenobasilar según Upledger. (Immediate changes to labour progression following the application of Upledger's modified method of balancing the sphenobasilar synchondrosis).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2006. [BRCT](#)

The objective was to analyse and compare the presence or absence of uterine contractions in two groups, following the application of Upledger's technique for balancing the sphenobasilar synchondrosis.

Upledger's balancing manoeuvre for the sphenobasilar synchondrosis did not provoke any immediate uterine contractions in patients in the last three weeks of pregnancy.

Randomized controlled double-blinded clinical trial with a placebo group and an intervention group of equal sample size. Having confirmed that that patients had experienced no uterine contractions before the intervention, post-intervention examinations were carried out to confirm the presence or absence of uterine contractions after the application of the balancing technique. One hundred and eighteen (118) patients (with no known sphenobasilar synchondrosis dysfunctions) were studied, evenly distributed into two groups: an intervention group and a control group, with 59 subjects in each.

All measurements were taken using a foetal monitor.

This is an experimental, planned study with an independent, equally distributed sample group, seeking to measure the immediate effectiveness of this manoeuvre in women in the last three weeks of pregnancy by comparing results from the two groups- the group that received the intervention and the group that received the placebo.

118 subjects were studied, with 59 in each group. The significance level was 95% and the variables were dichotomous. There was a considerable difference ($p < 0.05$) between the effect of the balancing manoeuvre applied to the sphenobasilar synchondrosis and the placebo.



After applying the technique and completing the study, Upledger's balancing manoeuvre for the sphenobasilar synchondrosis was seen to provoke uterine contractions in the women in the last three weeks of pregnancy within 5 minutes of applying the technique.

Campón Chekroun AM. *Efectos de la técnica de la compresión del seno carotideo derecho sobre la tensión arterial y la frecuencia cardíaca en pacientes hipertensos medicados. (The effects of manual compression of the right carotid sinus on blood pressure and heart rate in patients with hypertension who are receiving treatment)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2012. [BRCT](#)

The objective of the study was to identify the effects of stimulating the right carotid sinus on blood pressure and heart rate in patients with hypertension who are taking medication one minute, five minutes and sixty minutes after the intervention.

Experimental, randomized study with independent blinded evaluation of the results.

"Convenience" sampling- includes cases where the patient has attended a consultation in one of several health centres, has fulfilled the inclusion and exclusion criteria and has been asked to participate in the study.

Pre-intervention blood pressure and heart rate were measured, after which the appropriate technique was applied, depending on whether the patient belonged to the control or experimental group. After applying the technique, the measurements were taken again and the results were recorded at the pre-determined time intervals.

The total number of patients studied was 64 subjects (33 in the experimental group and 31 in the control group). The subjects were aged between 20 and 56, with an average age of 39.84 ± 8.74 .

There were differences between the two groups in the pre-intervention heart rate measurements, while there were no differences observed in the other variables. No statistically significant differences were found in systolic blood pressure either in the control group or overall ($F = 0.773$; $p = 0.48$) or between the two groups ($p > 0.05$). However, there were differences observed in the experimental group ($F = 5.675$; $p = 0.002$).

These differences were found between the measurements taken before the intervention and one minute after the intervention; before the intervention and five minutes after the intervention; before the intervention and sixty minutes after the intervention; one minute and five minutes after the intervention and one minute and sixty minutes after the intervention. There were no significant differences in diastolic blood pressure either in the control group, or overall ($F = 1.603$; $p = 0.206$) or between the different time intervals. There were statistically significant differences found in the experimental group between: the measurements taken before the intervention and one minute after the intervention; before the intervention and five minutes after the intervention; one minute and sixty minutes after the intervention and five minutes and sixty minutes after the intervention.



There was no significant difference in heart rate in the control group or overall ($F = 2.424$; $p = 0.082$). The results obtained analytically revealed a significant difference between the measurements taken one minute and sixty minutes after the intervention.

In the experimental group, overall differences were observed ($F = 17.168$; $p < 0.001$) and significant difference were observed between the pre-intervention and all post-intervention measurements but not between the various post-intervention measurements.

The technique was found to have an immediate effect on the variables studied, which seemed not to last in the medium term and which was most pronounced in systolic blood pressure. The technique was found to have a significant effect clinically on all of the variables studied (decreased systolic blood pressure, diastolic blood pressure and heart rate), seen in the measurements taken immediately after applying the technique. However, the clinical effect one hour after applying the compression technique on the right carotid sinus in patients with hypertension, taking medication, was small and insignificant.

Díaz Muñoz CL. *La manipulación cervical con thrust C3-C4 reduce la frecuencia cardíaca en pacientes con hipertensión arterial. (Cervical osteopathic manipulation on C3-C4 with a thrust reduces heart rate in patients with arterial hypertension).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2012. [BRCT](#)

Arterial hypertension is the main cause of death in the majority of countries, affecting 20% of the adult population, generating a very high cost to society. In recent years, interest in and social awareness on this topic, particularly in the field of osteopathy, has been generated from studies carried out on heart rate variables, analysing the causes of arterial hypertension and developing new techniques to treat it.

The objective of this study was to analyse the immediate effect of osteopathic manipulative techniques on C3-C4 with a thrust on heart rate in subjects with hypertension.

Randomized, experimental, blinded, controlled study. Fifty nine ($n=59$) patients with hypertension were randomly distributed into two groups: an experimental group ($n=31$) and a control group ($n=28$). An initial assessment (pre-intervention) and a final assessment (post-intervention) were carried out, analysing changes in heart rate. The tests used were the Mitchell, Jackson and Klein tests. The technique applied was the thrust manoeuvre in rotation for somatic dysfunctions in ERS or in laterality for somatic dysfunctions in FRS.

There were no differences in the control group before and after the manipulation. However, in the experimental group, significant changes were observed in the heart rate in the left arm, the heart rate in the right arm, the heart rate when resting and the heart rate when standing.

The application of the cervical osteopathic manipulative technique on subjects with hypertension produces a significant reduction in different heart rate variables.



Núñez Fernández D. *Variación de los volúmenes respiratorios en el sujeto asmático tras la técnica de impulso en rotación sentado de la charnela dorso-lumbar. (Variation in respiratory volumes in asthmatic subjects after applying the thrust technique in rotation to the thoracolumbar junction [seated]).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2014. [BRCT](#)

The objective was to determine possible variations in FVC, FEV1, FEV1/FVC ratio, PEF and the MiniAQLQ quality of life questionnaire after applying osteopathic manual therapy to asthmatic subjects.

12 subjects with intrinsic asthma were studied. The variables analysed were FVC, FEV1, FEV1/FVC ratio, PEF and the MiniAQLQ quality of life questionnaire. The intervention protocol required 5 treatment sessions, with 7 techniques related to the pathology applied in each session to different segments.

No significant effects of the treatment were observed for FVC or FEV1. Neither was there any significant effect of the treatment on the FEV1/FVC ratio. The results obtained for the variable PEF showed that treatments 2, 3, 4 and 5 had a significant effect ($p < 0.01$). There were also significant changes in each of the domains of the MiniAQLQ as well in the overall score.

Manual osteopathic therapy produces statistically significant changes in PEF and quality of life in asthmatic subjects.

It produces no significant changes in FVC, FEV1 or the FEV1/FVC ratio although a slight tendency towards improvement was observed in the latter.

San Segundo Riesco R. *Variaciones en la movilidad lumbopélvica en pacientes estreñidos tras la maniobra hemodinámica abdominal modificada. (Variations in lumbopelvic mobility in patients with constipation, after applying the modified abdominal hemodynamic manoeuvre).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2014. [BRCT](#)

Functional constipation is frequently treated in Primary Care. Recent studies have revealed a clinical relationship between the T10-T12 segments and the intestine.

The objective of the study is to evaluate the effects of the modified abdominal hemodynamic manoeuvre on patients with constipation by measuring the Pressure Pain Threshold (PPT) (UDP) in T10, T11 and T12 and inclination in T12 and S1; by applying the Sit and Reach test and evaluating the patient's posture, using the SAPO programme.

Randomized clinical controlled double-blinded trial with 62 patients ($n=62$); a Control Group (CG: $n=31$) and an Experimental Group (EG: $n=31$). The CG completed 30 deep diaphragmatic breaths and the EG received the modified abdominal hemodynamic manoeuvre.

PPT in T11: In the EG, the pre / post-intervention difference was 0.995kg (I.C.95% = 0.640 to 1.35; $p < 0.001$, with a moderate-high effect size, using Cohen's $d = 0.61$).



PPT in T12: In the EG, the pre / post-intervention difference was 1.34kg (I.C.95% = 0.893 to 1.178; $p < 0.001$, Cohen's $d = 0.62$); T12 inclination: EG, post-intervention, an increase of 8.7% (I.C.95% = 7.1 to 10.4°; $p < 0.001$ Cohen's $d = 0.58$).

Inclination of the sacrum, EG, a difference of 6.4% (I.C.95% = 4.3 to 8.3°; $p < 0.001$ Cohen's $d = 0.43$).

The Sit and Reach test: EG, an average increase of 2.33cm (I.C.95% = 1.72 to 2.94cm; $p < 0.001$ Cohen's $d = 0.25$).

Applying the modified abdominal hemodynamic manoeuvre to patients with functional constipation produces immediate changes, increasing the pain threshold in the T10, T11 and T12 vertebrae, increasing lumbar flexion and improving flexibility in the lower limbs.

Martinez Loza E. *Efectos del tratamiento osteopático aplicado en los trastornos de la fertilidad. (The effects of osteopathic manipulative treatment, applied to fertility disorders).* Doctorate Thesis from the Universidad de Sevilla. Seville; 2014. [BRCT](#)

The objective of this study was to describe the clinical characteristics of patients affected by fertility disorders who have received osteopathic manipulative treatment.

Analytical, observational, descriptive, transversal study. The study group received an open, non-randomized therapeutic intervention and their clinical characteristics were observed. 75 patients ($n=75$) with fertility disorders (average age 35.36 ± 3.3 years) received osteopathic manipulative treatment to improve the likelihood of getting pregnant. 99 women ($n=99$) were also studied, of whom eighty two belonged to the case group ($n=82$, average age 35 ± 4 years), presenting with fertility disorders and seventeen belonged to the control group ($n=17$, average age 27 ± 4 years) with no fertility disorders.

In the case group, it was found that the largest percentage were suffering from pelvic dysfunctions with sacral torsion ($n=58$: 58.59%), followed by cranial dysfunctions in sphenobasilar (SBS) compression ($n=53$: 53.54%), the uterus in anteversion ($n=29$: 29.29%) and lumbar spine dysfunctions in L5 ($n=27$: 27.27%). However, in the control group, the majority did not present with a cranial dysfunction ($n=11$: 11.11%), or a lumbar dysfunction ($n=8$: 8.08%) or problems with the position of the uterus ($n=16$: 16.16%), although there was a larger percentage of patients presenting with coccyx dysfunctions ($n=9$: 9.09%). An association was observed between the number of pregnancies and the presence/ absence of endometriosis ($p=0.022$) and even more so when the number of sessions is taken into account, considering the dichotomisation of one session ($p= 0.009$) but there was no association with the other variables ($p > 0.05$). It was found that fertility disorders are 148 times more likely to occur in patients presenting with uterus dysfunctions (OR = 148.000)/ IC: 17.275-1267.944), sacral torsion presents a risk 7 times greater in the case group (OR = 7.854; IC: 2.325-26.535) than the control group, cranial disorders were 7 times as common in the case group than the control group (OR = 7.010; IC: 2.267-21.677), lumbar dysfunctions were 4 times as common in the



case group (OR = 4.317; IC: 1.419-13.135) and sphenobasilar compression was 3 times more common in the case group than the control group (OR = 3.351; IC: 1.123-9.994).

The majority of patients with fertility disorders presented with problems surrounding the position of the uterus, with no uterine malformations, Fallopian tubes ablation alterations or endometriosis. They presented with pelvic, lumbar and cranial dysfunctions as well as thoracic postural disorders.

An association was observed between the number of pregnancies and the presence/ absence of endometriosis as well as the number of sessions carried out. The largest percentage were suffering from pelvic dysfunctions with sacral torsion, cranial dysfunctions in sphenobasilar (SBS) compression, the uterus in anteversion and lumbar spine dysfunctions in L5. The control group presented with no cranial or lumbar dysfunctions or problems with the position of the uterus but there was a higher prevalence of coccyx dysfunctions. There was a significant association between the study groups in relation to cranial and lumbar dysfunctions, coccyx dysfunctions, uterus dysfunctions, sphenobasilar (SBS) compression, L3 dysfunctions, sacral torsion, anteversion of the uterus, retroversion of the uterus and anteversion and retroversion of the uterus. Fertility disorders were 148 times more likely to occur in patients presenting uterus dysfunctions, 7 times more likely to occur in patients presenting sacral torsion, 4 times more likely to occur in patients presenting lumbar dysfunctions and 3 times more likely to occur in patients presenting associated sphenobasilar compression.

The study of 99 women, unable to conceive, showed successful pregnancy in 58.67% of the subjects with osteopathic manipulative treatment applied to the uterus (100%), to pelvic dysfunctions (94.45%), lumbar dysfunctions (88.63%) and cranial dysfunctions (86.36%).

Rodríguez López ES. *Modificaciones del flujo portal tras la técnica de bombeo del hígado en sujetos con síndrome hemorroidal. (Modifications to portal circulation after applying the liver pump technique to subjects with hemorrhoids).* Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2012. [BRCT](#)

The objective of this study was to identify the effects that the Liver Pump Technique (Healing) produces on Pressure Pain Threshold (PPT) in the thoracic vertebrae in relation to the sympathetic hepatic vertebrae; diameter, maximum average velocity (Vmax), portal blood flow (PBF) and portal congestion index (CI) in subjects with hemorrhoids.

An experimental, double-blinded, randomized clinical trial was carried out, with a study group.

Two groups were formed at random- the control group and the experimental group with 23 subjects in each. The Liver Pump Technique was applied to the experimental group and the therapist placed their hands on the subjects in the control group without applying the compression while the subject breathed slowly.

Pre and post-intervention measurements were taken immediately after and 30 minutes after the intervention, measuring the PPT in the thoracic vertebrae (D5-D9) (using an analogue



pressure algometer) as well as diameter, Vmax, PBF and portal IC (using a digital Hitachi Doppler ultrasound).

A statistical analysis was carried out with the SPSS 20.0 package, making intergroup and intragroup comparisons between the sample group (Kolmogorov-Smirnov test with the Lilliefors correction, Shapiro-Wilk test, student's t-test for independent samples, Mann-Whitney U test, Chi-squared test, Fisher's exact test, ANOVA test for repeated measurements, Friedman test and Wilcoxon test).

Distribution of the quantitative variables was normal, except for time lapsed since the last haemorrhoid flare up, current Visual Analogue Scale, alcohol consumption and pressure pain threshold. All of the variables complied with the homogeneity criteria, except for age.

Statistically significant differences ($p > 0.05$) were observed in the intergroup analysis of the variables PPT in the thoracic vertebrae, Vmax, PBF and portal IC. Statistically significant differences ($p > 0.05$) were found in the same variables during the intragroup analysis, in the measurements taken immediately and 30 minutes after the intervention. No differences were found in diameter in the intervention group ($p = 0.188$), nor when comparing the different time intervals at which the measurements were taken ($p > 0.05$).

The liver pump technique produces an increase immediately and 30 minutes after intervention in Pressure Pain Threshold in the thoracic vertebrae related to sympathetic hepatic innervation, in Vmax and in PBF in subjects presenting with haemorrhoids. It produces an immediate decrease in IC from the measurement taken 30 minutes after the intervention. The liver pump technique has no effect on the portal diameter in subjects presenting with haemorrhoids.

da Silva Reis E. *Estudio del efecto de la técnica aislada del bombeo del hígado sobre las enzimas hepáticas, en pacientes con enfermedad hepática grasa no alcohólica. (Study on the effect of the isolated liver pump technique on liver enzymes in patients with Non-Alcohol Related Fatty Liver Disease)*. Thesis on osteopathic medicine. Madrid School of Osteopathy: Madrid; 2014. [BRCT](#)

The objective of this study was to evaluate the effects of the isolated liver pump technique on the levels of liver enzymes (GGT, GOT, GPT) in patients carrying Non-Alcohol Related Fatty Liver Disease.

A randomized, blinded, controlled experimental clinical study was carried out, with simple randomization. The sample group contained 48 patients, diagnosed with Non-Alcohol Related Fatty Liver Disease. The subjects were divided into two groups.

The experimental group ($n=25$) was subjected to 10 liver pumps twice a week for three weeks.

The placebo group ($n=23$) was subjected to a simulation of the technique. After the interventions, all patients were subjected to a blood test.



A comparison of the average enzyme levels, pre and post-treatment in the experimental group revealed a significant reduction in the levels of all three enzymes (GGT pre = 99.56 ± 56.4 and post = 66.12 ± 39.4 ($p < 0.001$); GOT pre = 57.66 ± 29.0 and post = 41.68 ± 18.9 ($p < 0.001$) and GPT pre = 93.96 ± 40.2 and post = 62.56 ± 23.3 ($p < 0,001$).

The isolated liver pump technique was effective in reducing levels of liver enzymes (GGT,GOT,GPT) in patients carrying Non-Alcohol Related Fatty Liver Disease.



SCIENTIFIC THESES ON VISCERAL OSTEOPATHY PUBLISHED BY THE MADRID SCHOOL OF OSTEOPATHY AND PRESENTED IN THE SCIENTIFIC EUROPEAN FEDERATION OF OSTEOPATHS (SEFO) BETWEEN 1999 AND 2017

THESES ON OSTEOPATHY AND THE GASTROINTESTINAL SYSTEM

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
de Sousa (2009)	BRCT	Changes in levels of ammonia after applying the liver pump technique.	31
San Segundo Riesco (2014)	BRCT	Constipation, low back pain and the hemodynamic abdominal manoeuvre.	62
Rodríguez López (2012)	BRCT	Modifications to portal circulation after applying the liver pump technique.	23
da Silva Reis (2014)	BRCT	Non-Alcohol Related Fatty Liver Disease and the liver pump technique.	48

BRCT = Blinded Randomised Controlled Trial.

THESES ON OSTEOPATHY AND THE UROGENITAL SYSTEM

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Oliva Pascual-Vaca et al. (2017)	BRCT	Renal lithiasis.	46
de Almeida et al. (2010)	NCES	Intravaginal pressure and perineal muscle tone.	40
Vecino Rodriguez (2006)	BRCT	Labour progression after balancing the sphenobasilar synchondrosis.	118
Martinez Loza (2014)	Case-Control	Infertility and osteopathy.	99

BRCT = Blinded Randomised Controlled Trial.



THESES ON OSTEOPATHY AND CARDIALGIA

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Morán Benito (2008)	BRCT	AHT and pressure on the aortic valve.	70
Moro Pantoja (2014)	BRCT	AHT and the muscle energy technique applied to segment C7-T1.	61
Campón Chekroun (2012)	BRCT	AHT and the effects of manual compression of the right carotid sinus.	64
Díaz Muñoz (2012)	BRCT	AHT and AT reduction with a thrust C3-C4.	59

BRCT = Blinded Randomised Controlled Trial.

THESES ON OSTEOPATHY AND PULMONOLOGY

AUTHOR	TYPE OF STUDY	PATHOLOGY	POPULATION
Marquez Ambite (2005)	BRCT	Stretching technique for the diaphragm and elevation of the cupulae of the diaphragm.	65
Oscoz Muñoa (2005)	BRCT	Effect of stretching technique for the anterior part of the diaphragm on spirometry tests in smokers.	60
Baño Alcaraz (2011)	BRCT	Spirometric variations in smokers after applying osteopathic manipulative techniques to the base of the lung.	64
Martínez Fernández (2011)	BRCT	Asthma and the effects of the thumb-move technique (C7-T1).	40
Núñez Fernández (2014)	BRCT	Asthma and variations in respiratory volumes after applying the thrust technique in rotation to the thoracolumbar junction (seated).	12

BRCT = Blinded Randomised Controlled Trial.