Evidence to support osteopathic treatment of low back pain – a summary table of osteopathic and osteopathic-relevant evidence

(May, 2016)

- Research relevant to osteopathic treatment of musculoskeletal pain comes from a number of healthcare professions, including osteopathy, chiropractic, physiotherapy, and medicine. Much of the research has focused on spinal manipulation and mobilization;

- In the management of low back pain (LBP), a range of studies are presented looking at different symptom presentations. Studies looking at acute and subacute low back pain are included in entries 1-8; and mixed studies are included in studies 9-16; and chronic low back pain studies are included in studies 17-29. Studies examining low back pain associated with pregnancy and post-partum are described in entries 30-37;

- In the summary of findings, the authors’ conclusions are reported verbatim from the study. However, it is important to read the full text of the studies and critically review the findings to decide if you agree or challenge the authors’ conclusions. Useful tools to help with critical appraisal can be found at http://www.casp-uk.net/#!casp-tools-checklists/c18f8;

- Summaries of the individual studies are presented in the table below, and appear in descending date order;

- All abbreviations are presented at the end of the table.
<table>
<thead>
<tr>
<th>Citation</th>
<th>Study characteristics</th>
<th>Study conclusions</th>
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**Study population:** Patients with low back pain;  
**Duration of symptoms:** Acute;  
**Sample size:** N= 101;  
**Intervention:** OMT and sham OMT;  
**Comparator/Control:** NSAID (Diclofenac), and placebo;  
**Outcome measures:** RMDQ, VAS, and SF-12;  
**Outcome measurement interval:** Baseline and 12 weeks. | The authors concluded “in a subgroup of patients with acute nonspecific LBP, spinal manipulation was significantly better than nonsteroidal anti-inflammatory drug diclofenac and clinically superior to placebo”. |
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Acute;  
**Sample size:** N= 2674;  
**Intervention:** Spinal manipulative therapy;  
**Comparator/Control:** Various among the studies reviewed;  
**Outcome measures:** Various among the studies reviewed;  
**Outcome measurement interval:** Various among the studies reviewed. | The authors concluded that “SMT is no more effective for acute low back pain than inert interventions, sham SMT or as adjunct therapy. SMT also seems to be no better than other recommended therapies. Our evaluation is limited by the few numbers of studies; therefore, future research is likely to have an important impact on these estimates. Future RCTs should examine specific subgroups and include an economic evaluation”. |
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**Study population:** Military personnel with low back pain;  
**Duration of symptoms:** Acute  
**Sample size:** N=109;  
**Intervention:** OMT + usual care;  
**Comparator/Control:** Usual care;  
**Outcome measures:** Pain (VAS); Disability (RMDQ); General health (SF-36); Patient expectation questionnaire;  
**Outcome measurement interval:** Baseline, and after each treatment visit.  
The authors concluded that “this study supports the effectiveness of OMT in reducing ALBP pain in active duty military personnel”. |
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Patients had experienced pain every day for 28 days prior to randomisation, or for 21 out of 28 days prior to randomisation, and 21 out of the 28 days before that.  
**Sample size:** N=1334  
**Intervention:** Best care alone, exercise classes; SMT, or usual care + SMT + exercise;  
**Outcome measures:** RMDQ, modified  
The authors concluded that “relative to “best care” in general practice, manipulation followed by exercise achieved a moderate benefit at three months and a small benefit at 12 months; spinal manipulation achieved a small to moderate benefit at three months and a small benefit at 12 months; and exercise achieved a small benefit at three months but not 12 months”. |

Study design: RCT;  
Study population: Patients with low back pain;  
Duration of symptoms: Patients had experienced pain every day for 28 days prior to randomisation, or for 21 out of 28 days prior to randomisation, and 21 out of the 28 days before that.  
Sample size: N=1334  
Intervention: Best care alone, exercise classes; SMT, or usual care + SMT + exercise;  
Outcome measures: RMDQ, modified Von Korff scale, SF-36, FABQ, and EQ5D;  
Outcome measurement interval: 3 months and 12 months.

The authors concluded that “spinal manipulation is a cost effective addition to "best care" for back pain in general practice. Manipulation alone probably gives better value for money than manipulation followed by exercise”.


Study design: Cost utility analysis of RCT;  
Study population: Patients with spinal pain;  
Duration of symptoms: 2-12 weeks;  
Sample size: N=201;  
Intervention: Usual GP care + 3 or 4 sessions of OMT;  
Comparator/Control: Usual GP care;  
The authors concluded that “a primary care osteopathy clinic may be a cost-effective addition to usual GP care, but this conclusion was subject to considerable random error. Rigorous multi-centre studies are needed to assess the
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<th></th>
<th>Study design</th>
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<th>Intervention</th>
<th>Comparator/Control</th>
<th>Outcome measures</th>
<th>Outcome measurement interval</th>
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<tr>
<td>7</td>
<td>Study design: RCT;</td>
<td>Study population: Patients with spinal pain;</td>
<td>Duration of symptoms: 2-12 weeks;</td>
<td>Sample size: N=201;</td>
<td>Intervention: Usual GP care + 3 or 4 sessions of OMT;</td>
<td>Comparator/Control: Usual GP care;</td>
<td>Outcome measures: EASPS, SF-12, EQ5D. and SFMQ;</td>
<td>Outcome measurement interval: 2 and 6 months.</td>
<td>The authors concluded that “a primary care osteopathy clinic may be a cost-effective addition to usual GP care, but this conclusion was subject to considerable random error. Rigorous multi-centre studies are needed to assess the generalizability of this approach”.</td>
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<td>8</td>
<td>Study design: RCT;</td>
<td>Study population: Patients with non-specific low back pain;</td>
<td>Duration of symptoms: Subacute low back pain;</td>
<td>Sample size: N=109;</td>
<td>Intervention: OMT;</td>
<td>Comparator/Control: Short-wave diathermy;</td>
<td>Outcome measures: Pain (VAS); Spinal flexion; return to work; recovery; and</td>
<td>Outcome measurement interval: 2 and 6 months.</td>
<td>The authors concluded that “the outcome of treatment was unrelated to the initial severity or duration of pain or to the trend of pain towards deterioration or improvement. It is, therefore, unlikely that the results simply reflect the natural history of low back pain. Benefits obtained with osteopathy and SWD in this study may have been achieved</td>
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<td><strong>Study design:</strong> SR and MA  <strong>Study population:</strong> Patients with non-specific low back pain, and women experiencing non-specific low back pain during pregnancy and post-partum.  <strong>Duration of symptoms:</strong> Acute and chronic;  <strong>Sample size:</strong> N=1502 for all studies included  <strong>Intervention:</strong> OMT  <strong>Comparator/Control:</strong> various among the studies reviewed;  <strong>Outcome measures:</strong> various among the studies reviewed;  <strong>Outcome measurement interval:</strong> various among the studies reviewed.</td>
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| The researchers concluded that “clinically relevant effects of OMT were found for pain reduction and improvement in functional status in patients with acute and chronic nonspecific LBP, and for LBP in patients while pregnant and postpartum at 3 months posttreatment. However, larger, high-quality randomized controlled trials with robust comparison groups are recommended”.

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<th>10</th>
<th>Furlan AD, Yazdi F, Tsertsvadze A, et al. A systematic review and meta-analysis of efficacy, cost-effectiveness, and safety of selected complementary and alternative medicine for neck and low back pain. Evidence-Based Study design: Systematic review and meta-analysis;  <strong>Study population:</strong> Patients with neck and low back pain;  <strong>Duration of symptoms:</strong> Various among</th>
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| The authors concluded that “CAM treatments were significantly more efficacious than no treatment, placebo, physical therapy, or usual care in reducing...
**Sample size:** N= 162 (low back pain patients) and N= 104 (neck pain patients);  
**Intervention:** Techniques used in CAM treatments;  
**Comparator/Control:** Various among included studies;  
**Outcome measures:** VAS, MPQ, RMDQ, NPQ, PDI, and ODI;  
**Outcome measurement interval:** immediate, short term (<3 months), intermediate (3-12 months) and long term (> 12 months). | pain immediately or at short-term after treatment. CAM therapies did not significantly reduce disability compared to sham. None of the CAM treatments was shown systematically as superior to one another. More efforts are needed to improve the conduct and reporting of studies of CAM treatments”. |
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Acute and chronic;  
**Intervention:** Osteopathic manipulation or mobilisation;  
**Comparator/Control:** Various among the studies reviewed;  
**Outcome measures:** Various among the studies reviewed; | The authors concluded that “a total of five of the 16 RCTs showed that OMT is effective for musculoskeletal pain (MSP) and 11 showed no difference between OMT and controls. These controls included sham ultrasound, placebo sham manipulation, no intervention, drugs, moist heat, chemonucleolysis, sham |
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<th>Study design</th>
<th>Review of RCTs; Study population: Patients with low back pain; Duration of symptoms: Acute and chronic; Sample size: The review identified 38 trials for management of acute low back pain, and 237 trials for the management of subacute and chronic low back pain; Interventions: Various interventions were included for example exercise, spinal manipulation, yoga, massage, and acupuncture; Comparator/Control: Various among the studies reviewed; Outcome measures: Various among the studies reviewed; Outcome measurement interval: Various among the studies reviewed.</th>
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<td>Treatment + standard care, chiropractic techniques, antiphlogistics, and cortisone injections, exercises or manipulative physiotherapy, manual mobilization, short-wave diathermy and a placebo, or standard care. The evidence is therefore inconclusive.</td>
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Various among the studies reviewed.

**Study design:** A systematic review of systematic reviews;

**Study population:** Patients with low back pain;

**Duration of symptoms:** Various among the studies reviewed;

**Sample size:** N=239;

**Intervention:** Spinal manipulation

**Comparator/Control:** Various among the studies reviewed;

**Outcome measures:** Various among the studies reviewed;

**Outcome measurement interval:** Various among the studies reviewed.

The authors concluded that “collectively these data do not demonstrate that spinal manipulation is an effective intervention for any condition. Given the possibility of adverse effects, this review does not suggest that spinal manipulation is a recommendable treatment” but the review was strongly criticised by experienced researchers with special interests in OMT concerning their views on the many flaws in the review.

**Study design:** RCT;

**Study population:**

**Duration of symptoms:** Acute and Chronic (4 weeks to 6 months);

**Sample size:** N=60;

**Intervention:** OMT + PT + heat;

**Comparator/Control:** Heat and PT;

**Outcome measures:** Current and average level of pain (NRS); disability (RMDQ).

**Outcome measurement interval:** Not disclosed.

The authors concluded that ‘in the area of pain, as well as in the area of the disabilities a clinically relevant improvement could be achieved.’ (Franke et al, 2014)
| Study design: A blinded review  
Study population: Patients with neck and low back pain;  
Duration of symptoms: Acute and chronic  
Sample size: N=1421;  
Intervention: SMT  
Comparator/Control: Various  
Outcome measures: Various among the different studies reviewed;  
Outcome measurement interval: Various among the different studies reviewed. |
| The researchers concluded that “although some results are promising, the efficacy of manipulation has not been convincingly shown. Further trials are needed, but much more attention should be paid to the methods of study”. |

| Study design: Controlled clinical trial;  
Study population: Patients with low back pain;  
Duration of symptoms: Acute and chronic;  
Sample size: N=49;  
Intervention: OMT  
Comparator/Control: Exercise and advice on posture;  
Outcome measures: Information not available;  
Outcome measurement interval: |
<p>| The researchers found that the advantage to manipulated patients was maximal between 1 and 2 weeks after commencing treatment, but was not discernable after 4 weeks. |</p>
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<th>Information not available.</th>
<th>Study design: Systematic review; Study population: Patients with low back pain; Duration of symptoms: chronic; Sample size: N=330; Intervention: OMT; Comparator/Control: various among the studies reviewed; Outcome measures: various among the studies reviewed; Outcome measurement interval: various among the studies reviewed.</th>
<th>The study’s authors concluded that “there are only two studies assessing the effect of the manual therapy intervention applied by osteopathic clinicians in adults with CNSLBP. One trial concluded that the osteopathic intervention was similar in effect to a sham intervention, and the other suggests similarity of effect between osteopathic intervention, exercise and physiotherapy. Further clinical trials into this subject are required that have consistent and rigorous methods. These trials need to include an appropriate control and utilise an intervention that reflects actual practice”.</th>
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<td>Study design: Systematic review; Study population: Patients with low pain. It was safe, parsimonious, and well accepted by patients”.</td>
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<td>19</td>
<td>Study design: RCT Study population: Chronic; Duration of symptoms: Sample size: N=21; Intervention: OMT + SE; Comparator/Control: Specific exercises (SE); Outcome measures: Pain (VAS); Disability (RMDQ); LBP-DQ; Kinematics of thoracic spine/pelvis during forward flexion. Outcome measurement interval: Information not available.</td>
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| 20 | Rubinstein SM, van Middelkoop M, Assendelft WJ, et al. Spinal manipulative therapy for A total of 26 RCTs representing 6070 participants
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<th>Study design: Systematic review; Study population: Patients with low back pain; Duration of symptoms: Chronic; Sample size: N=6070; Intervention: Manipulative therapy delivered by various professional groups; Comparator/Control: Various among the studies reviewed; Outcome measures: Various among the studies reviewed; Outcome measurement interval: Various among the studies reviewed.</th>
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were included, of which 9 had a low risk of bias. The authors concluded that “there is high quality evidence that spinal manipulative therapy (SMT) has a small, statistically significant but not clinically relevant, short-term effect on pain relief and functional status compared to other interventions. The robustness of the findings was confirmed by sensitivity analyses. There is varying quality of evidence that SMT has a statistically significant effect on the above outcomes when added to another intervention. There is low quality evidence that SMT is not statistically significantly more effective than inert interventions or sham SMT for the previously-mentioned outcomes”. Based on the heterogeneity of the populations, interventions,
<table>
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<th>Study</th>
<th>Authors</th>
<th>Study design</th>
<th>Study population</th>
<th>Duration of symptoms</th>
<th>Sample size</th>
<th>Intervention</th>
<th>Comparator/Control</th>
<th>Outcome measures</th>
<th>Outcome measurement interval</th>
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<tr>
<td>14</td>
<td>physical and rehabilitation interventions for chronic non-specific low back pain. European Spine Journal. 2011; 20(1):19-39. <a href="http://www.ncbi.nlm.nih.gov/pubmed/20640863">http://www.ncbi.nlm.nih.gov/pubmed/20640863</a></td>
<td>back pain; <strong>Duration of symptoms</strong>: Chronic; <strong>Sample size</strong>: N=8816; <strong>Intervention</strong>: Various including exercise therapy, back school, TENS, LLLT, massage, behavioural interventions, lumbar supports, traction, and multidisciplinary treatments; <strong>Comparator/Control</strong>: Various among included studies; <strong>Outcome measures</strong>: Various among included studies; <strong>Outcome measurement interval</strong>: Various among included studies.</td>
<td>and comparison groups, the researchers concluded that “there are insufficient data to draw firm conclusion on the clinical effect of back schools, low-level laser therapy, patient education, massage, traction, superficial heat/cold, and lumbar supports for chronic LBP management”.</td>
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| 22    | Chown M, Whittamore I, Rush M, Allan S, Scott D, Archer M. A prospective study of patients with chronic back pain randomised to group exercise, physiotherapy or osteopathy. Physiother. 2008;94:21–28. doi: 10.1016/j.physio.2007.04.014 [http://www.physiotherapyjournal.com/article/S0031-9406(07)00126-5/abstract](http://www.physiotherapyjournal.com/article/S0031-9406(07)00126-5/abstract) | **Study design**: RCT **Study population**: Patients with low back pain; **Duration of symptoms**: Chronic; **Sample size**: N=239; **Intervention**: Group exercise classes led by physiotherapists; **Comparator/Control**: One to one predominantly manipulative physiotherapy, or osteopathy; **Outcome measures**: Disability (ODI); general health (EQ5D); pain (VAS); mobility (Shuttle Walk Test). | The authors concluded that “the study supports the use of a variety of approaches for the treatment of chronic low back pain. Particular attention needs to be given to the problems of attracting enough participants for group sessions, as these can be difficult to schedule in ways that are convenient for different participants”.


**Study design:** RCT;  
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Chronic  
**Sample size:** Information not available;  
**Intervention:** OMT + usual care;  
**Comparator/Control:** sham OMT + usual care;  
**Outcome measures:** Pain (VAS); Disability (ODI).  
**Outcome measurement interval:** Not disclosed.

The authors concluded that “…OMT appears to provide benefits over and above usual care for the treatment of CLBP. The improvement in the OMT compared to the SMT demonstrated that placebo effects… do not justify per se the results of this study.’ (Franke et al, 2014).


**Study design:** literature review;  
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Chronic;  
**Sample size:** Four RCTs were located;  
**Intervention:** Spinal manipulation;  
**Comparator/Control:** Various among the different studies reviewed;  
**Outcome measures:** Various among the different studies reviewed;  
**Outcome measurement interval:** Not disclosed.

The authors conclude that “the early benefits of manipulation for the management of disc herniation is based on weak evidence and since the estimate of risk, which is believed to be rare with appropriately trained practitioners, is difficult to ascertain, care should be taken in choosing this approach to treatment and it seems prudent
<table>
<thead>
<tr>
<th>Study ID</th>
<th>Authors</th>
<th>Study Title</th>
<th>Study Design</th>
<th>Study Population</th>
<th>Duration of Symptoms</th>
<th>Sample Size</th>
<th>Intervention</th>
<th>Comparator/Control</th>
<th>Outcome Measures</th>
<th>Outcome Measurement Interval</th>
<th>Study Conclusion</th>
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<tr>
<td>25</td>
<td>Licciardone JC, Brimhall AK, King LN.</td>
<td>Osteopathic manipulative treatment (OMT) for low back pain: a systematic review and meta-analysis of randomized controlled trials. <em>BMC Musculoskeletal Disorders.</em> 2005;6:43. <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1208896/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1208896/</a></td>
<td>Study design: SR and MA; Study population: Patients with low back pain; Duration of symptoms: Chronic; Sample size: N= 525; Intervention: OMT Comparator/Control: Various among the different studies reviewed; Outcome measures: General health (SF36); pain (VAS); disability (RMDQ); Work disability; Satisfaction with back care Outcome measurement interval: Various among the different studies reviewed;</td>
<td>The reviewers concluded that &quot;OMT significantly reduces low back pain. The level of pain reduction is greater than expected from placebo effects alone, and persists for at least three months. Additional research is warranted to elucidate mechanistically how OMT exerts its effects, to determine if OMT benefits are long-lasting, and to assess the cost-effectiveness of OMT as a complementary treatment for low back pain&quot;.</td>
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| **Outcome measures:** General health (SF36); pain (VAS); disability (RMDQ); work disability; satisfaction with back care;  
**Outcome measurement interval:** Baseline, one month, and six months. | Whether the benefits of osteopathic manipulative treatment can be attributed to the manipulative techniques themselves or whether they are related to other aspects of osteopathic manipulative treatment, such as range of motion activities or time spent interacting with patients, which may represent placebo effects”. |
**Study design:** RCT  
**Study population:** Patients with low back pain;  
**Duration of symptoms:** Chronic;  
**Sample size:** N=57  
**Intervention:** OMT;  
**Comparator/Control:** Sham treatment;  
**Outcome measures:** Disability (RMDQ); pain (VAS); general health (SF-36); and side effects of treatment;  
**Outcome measurement interval:** Not disclosed. | The authors concluded that ‘OMT – in comparison to the sham treatment - shows statistically significant and clinically important improvements regarding primary and secondary outcome measures.’ |
| Andersson GB, Lucente T, Davis AM, Kappler RE, Lipton JA, Leurgans S. A comparison of osteopathic spinal manipulative treatment with | **Study design:** RCT  
**Study population:** Patients with low back pain; | The authors concluded that “osteopathic manual care and standard medical care have |

| **Duration of symptoms:** | Between 3 weeks and six months; |
| **Sample size:** | N=155 |
| **Intervention:** | OMT (N=83); |
| **Comparator/Control:** | standard medical treatment (N=72); |
| **Outcome measures:** | Pain (VAS); disability (RMDQ); Oswestry Questionnaire, selected questions from NASS; ROM; a pain drawing, and SLRT; |
| **Outcome measurement interval:** | information not available. |

The study’s authors reported that “the results thus far tend to suggest that manipulation under anaesthesia will produce only temporary clinical improvement in cases with electromyographic evidence of nerve root compression, and an operation eventually will be needed. With no evidence of nerve root compression, manipulation will probably bring lasting relief”.


| **Study design:** | Pre- and post-evaluation study; |
| **Study population:** | Patients with nerve root compression secondary to lumbar disc herniation; |
| **Duration of symptoms:** | 12 months |
| **Sample size:** | N=47; |
| **Intervention:** | OMT under anaesthesia; |
| **Comparator/Control:** | Conservative treatment or surgery; |
| **Outcome measures:** | Electromyographic readings, and “clinical improvement”; |
| **Outcome measurement interval:** | Baseline, 6 and 12 months |

The study’s authors reported that “similar clinical results in patients with subacute low back pain. However, the use of medication was greater with standard care”.

<p>| <strong>Duration of symptoms:</strong> | Between 3 weeks and six months; |
| <strong>Sample size:</strong> | N=155 |
| <strong>Intervention:</strong> | OMT (N=83); |
| <strong>Comparator/Control:</strong> | standard medical treatment (N=72); |
| <strong>Outcome measures:</strong> | Pain (VAS); disability (RMDQ); Oswestry Questionnaire, selected questions from NASS; ROM; a pain drawing, and SLRT; |
| <strong>Outcome measurement interval:</strong> | information not available. |</p>
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<th>Page</th>
<th>Study Design</th>
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<tbody>
<tr>
<td>30</td>
<td>RCT</td>
<td>Women post-partum</td>
<td>≥ 3 months</td>
<td>N=80</td>
<td>OMT</td>
<td>Waiting list control</td>
<td>10-point Visual Analogue Scale; Oswestry Disability Index (German version);</td>
<td>Information not available</td>
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<tr>
<td>31</td>
<td>Literature review</td>
<td>Women during pregnancy</td>
<td>≥ 3 months</td>
<td>Not applicable</td>
<td>OMT</td>
<td>Various among the studies reviewed;</td>
<td>Various among the studies reviewed;</td>
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<td>Study Reference</td>
<td>Study Design</td>
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**Study population:** Patients with low back and/or pelvic pain during pregnancy;  
**Duration of symptoms:** various durations;  
**Sample size:** N=5121  
**Intervention:** Various interventions including exercise in different forms; manual therapy, and education.  
**Comparator/Control:** Various among the 15 RCTs examined;  
**Outcome measures:** various among the studies reviewed;  
**Outcome measurement interval:** various among the studies reviewed. | The authors concluded that “evidence from single studies suggests that acupuncture or craniosacral therapy improves pregnancy-related pelvic pain, and osteomaneipulative therapy or a multi-modal intervention (manual therapy, exercise and education) may also be of benefit.” |
| 33 Gundermann S. Effectiveness of Osteopathic Treatment in Pregnant Women Suffering From Low Back Pain. A Randomized Controlled Trial. 2013. Unpublished D.O. Thesis. | **Study design:** RCT  
**Study population:** N/S pregnancy  
**Duration of symptoms:** At least one week;  
**Sample size:** N=41;  
**Intervention:** OMT;  
**Comparator/Control:** No treatment;  
**Outcome measures:** VAS; Frequency of pain; RMDQ; Questionnaire postpartum; | The study’s authors concluded that 'Four osteopathic treatments over a period of 8 weeks led to statistically significant and clinically relevant positive changes of pain intensity and frequency in pregnant women suffering from low back pain.’ |
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<th>Study</th>
<th>Authors</th>
<th>Details</th>
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<td>34</td>
<td>Schwerla F, Rother K, Rother D, Ruetz M.</td>
<td>Vol 1: Proceedings of the 9th International Symposium of Osteopathy 2012. Nantes, France: Akademie für Osteopathie; 2012. Osteopathic treatment of women with persistent low back/pelvic girdle pain postpartum. <strong>Study design: RCT</strong>  <strong>Study population:</strong> Women suffering persistent low back pain after childbirth; <strong>Duration of symptoms:</strong> Chronic  <strong>Sample size:</strong> N= 80  <strong>Intervention:</strong> OMT  <strong>Comparator/Control:</strong> No treatment;  <strong>Outcomes measured:</strong> Pain (VAS); OPQ; Different specific health problems. <strong>Outcome measurement interval:</strong> information not available. The authors concluded that ‘four osteopathic treatments over a period of eight weeks led to statistically significant and clinically relevant positive changes of pain intensity and effects of low back pain on everyday activities in women suffering from low back pain after childbirth’</td>
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<td>35</td>
<td>Licciardone JC, Buchanan S, Hensel KL, King HH, Fulda KG, Stoll ST.</td>
<td>Osteopathic manipulative treatment of back pain and related symptoms during pregnancy: a randomized controlled trial. Am J Obstet Gynecol. 2010;202(1):43.e1-8 <a href="http://www.ncbi.nlm.nih.gov/pubmed/19766977">http://www.ncbi.nlm.nih.gov/pubmed/19766977</a>  <strong>Study design: RCT;</strong>  <strong>Study population:</strong> Patients with low back pain; <strong>Duration of symptoms:</strong> Not specified;  <strong>Sample size:</strong> N=144;  <strong>Intervention:</strong> usual obstetrical care and OMT;  <strong>Comparator/Control:</strong> usual obstetrical care and sham ultrasound treatment or usual obstetrical care only;  <strong>Outcome measures:</strong> RMDQ; pain 11-point NRS; The authors conclude that “osteopathic manipulative treatment slows or halts the deterioration of back-specific functioning during the third trimester of pregnancy”.</td>
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<td>Study Design</td>
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<td>36</td>
<td>Recknagel C, Roà J. Study on the Effectiveness of Osteopathic Treatment for Women with Persistent Post Partum Back Pain. A Randomized Controlled Trial. 2007. Unpublished D.O. Thesis.</td>
<td>Study design: RCT; Study population: Patients with post-partum low back pain; Duration of symptoms: Chronic (3-24 months); Sample size: N=40 Intervention: OMT; Comparator/Control: No treatment; Outcome measures: Pain (VAS); OPQ; Regions of dysfunction; Outcome measurement interval: baseline and 4 weeks.</td>
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<td>37</td>
<td>Peters R, Van Der Linde M. Osteopathic Treatment of Women with Low Back Pain during Pregnancy. A Randomized Controlled Trial. 2006. Unpublished D.O. Thesis.</td>
<td>Study design: RCT; Study population: N/S pregnancy; Duration of symptoms: Acute (at least one week); Sample size: N=60; Intervention: OMT; Comparator/Control: No treatment; Outcome measures: Pain (VAS); and disability (QBPDS); Outcome measurement interval: Not disclosed.</td>
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Abbreviations:

**CAM**: Complementary and Alternative Medicine  
**CLBP**: Chronic low back pain  
**EASPS**: Extended Aberdeen Spinal Pain Score  
**EQ5D**: Euroqol 5D  
**FABQ**: Fear Avoidance Beliefs Questionnaire  
**LBP-DQ**: Low Back Pain Disability Questionnaire  
**LLLT**: Low level laser therapy  
**MPQ**: McGill Pain Questionnaire  
**NASS**: North American Spinal Surgeons Questionnaire  
**NPQ**: Northwick Park Pain Questionnaire  
**NRS**: Numerical Rating Scale  
**N/S**: Non-specific  
**OMT**: Osteopathic Manipulative Therapy  
**OPQ**: Orebro Pain Questionnaire  
**ODI**: Oswestry Disability Index  
**PDI**: Pain Disability Index  
**QBPDS**: Quebec Back Pain Disability Scale  
**RCT**: Randomised Controlled Trial  
**RMDQ**: Roland Morris Disability Questionnaire  
**RoM**: Range of Motion  
**SE**: Specific exercise  
**SF36**: Short Form-36  
**SFMQ**: Short Form McGill Pain Questionnaire  
**SMT**: Spinal Manipulative Therapy  
**TENS**: Transcutaneous Electrical Nerve Stimulation  
**VAS**: Visual Analogue Scale