



When to consider osteopathic manipulation

Patients with low back pain, headache, and neck pain can benefit from this approach.

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PRACTICE RECOMMENDATION

□ Consider osteopathic manipulation for low back pain that has not responded to customary care, and other musculoskeletal pain such as headache or neck pain. **(B)**

Strength of recommendation (SOR)

- (A)** Good-quality patient-oriented evidence
- (B)** Inconsistent or limited-quality patient-oriented evidence
- (C)** Consensus, usual practice, opinion, disease-oriented evidence, case series

A patient of yours has nonspecific back pain that fails to improve with the usual self-care measures. He asks you whether osteopathic manipulation might help. Would you be prepared to discuss the relevant clinical evidence?

For a patient such as this, expert guidelines do recommend referral for osteopathic spinal manipulation, which, if performed by a qualified physician, may be efficacious and cost effective. Limited data show that osteopathic manipulation may also be effective for nonspinal disorders.

We conducted a systematic review of the evidence for osteopathic manipulative treatment (OMT) as applied to several conditions. Specifically, we searched PubMed for English language articles published between 1970 and December 2007, using the keywords osteopathy, osteopathic medicine, osteopathic manipulation, spinal manipulation, and somatic dysfunction. Our findings follow.

How OMT contributes to wellness

Osteopathic manipulative procedures are based on the premise that the neuromuscular system is vital to maintaining homeostasis. Changes in the musculoskeletal system can affect other organs (somatovisceral reflex), and visceral pathology can manifest as abnormalities in musculoskeletal tissue texture and articular motion (viscerosomatic reflex).¹ These musculoskeletal changes are diagnosed as somatic dysfunction and are assigned International Statistical Classification of Diseases and Related Health Problems (ICD-9) codes corresponding to the area of the body in which these changes are palpated.² Similarly, OMT therapeutic procedures are assigned Evaluation and Management (E&M) codes corresponding to the number of body areas treated.

OMT comprises more than 100 different techniques used to treat somatic dysfunction. Some techniques are similar to those used by chiropractors and physical or massage

➤ **OMT led to a 30% reduction in back pain compared with several control therapies, which included NSAIDs and home exercises.**

therapists; others are unique to osteopathically trained physicians.

■ **OMT has multiple physiologic effects.** Mechanically, OMT causes articular release, freeing joint motion. Neuromuscularly, OMT generates afferent input into the dorsal root ganglion, diminishing motor neuron discharge and relaxing muscle fibers.³ Vascularly, OMT may increase nitric oxide concentration in the blood, promoting vasodilatation and increasing blood flow to peripheral vascular tissue.⁴ Neurochemically, OMT can transiently increase serum levels of anandamide, stimulating cannabinoid receptors in the brain.⁵

What the evidence says about OMT for back pain

Joint clinical practice guidelines issued in 2007 by the American College of Physicians and the American Pain Society give a weak recommendation based on moderate-quality evidence that manipulation is an appropriate nonpharmacologic modality for treating nonspecific acute and chronic low back pain that fails to improve with self-care.⁶

The Institute for Clinical Systems Improvement guidelines for back pain, updated in 2008, recommend referral to a spine therapy professional for manipulative treatment of nonspecific low back pain that has failed to improve with self-care after 2 weeks, or for a patient experiencing incapacitating pain. The guidelines suggest that referred patients usually demonstrate improvement within 3 to 4 visits and typically require no more than 6 visits.⁷

DO family practitioners appear to use OMT more often for pain in the back than for pain in other areas of the body.⁸ Although a large number of randomized controlled trials (RCTs) have examined the role of spinal manipulation for adults with back pain, regardless of the type of practitioner, fewer trials have focused on manipulation specifically performed by osteopathically trained physicians.

■ **Pain reduction is significant.** A meta-analysis was conducted on 8 RCTs involving patients with back pain of at least 3 weeks' duration, with 318 patients assigned to re-

ceive OMT vs 231 controls. Subjects in the OMT group received a variable number of OMT sessions over a given time frame per study protocol, while subjects in the control group were allowed to pursue standard care for back pain, including nonsteroidal anti-inflammatory agents (NSAIDs), muscle relaxants, narcotics, physical therapy, and home exercises. The authors found a significant (30%) overall reduction in pain rating in the OMT group compared with various control therapies at 4 and 12 weeks' follow-up (95% confidence interval [CI], -0.47 to -0.13; $P=.001$).⁹

Another study randomized 155 patients with subacute low back pain to receive standard care or standard care plus 8 sessions of OMT over 2 months. At follow-up, both groups had similar pain ratings on a visual analog scale, but participants in the OMT group required significantly less NSAIDs, muscle relaxants, and physical therapy.¹⁰

A few RCTs have investigated the role of OMT in adults with chronic low back pain. One study randomized 91 patients with nonspecific back pain of more than 3 months' duration to receive 7 sessions of OMT, 7 sessions of sham manipulative therapy, or usual care. (Sham manipulation consisted of range of motion and light touch without therapeutic intention.) Both OMT and sham therapy significantly decreased back pain at 1 month ($P=.01$ and $P=.003$, respectively), 3 months ($P=.001$, $P=.01$), and 6 months ($P=.02$, $P=.02$) compared with usual care.¹¹

A study conducted in the United Kingdom randomized 201 patients with spinal pain of 2 to 12 weeks' duration to receive usual care or usual care plus 3 OMT sessions. At 2 months' follow-up, the OMT group, compared with the usual care group, exhibited a significant reduction in spinal pain levels (95% CI, 0.7-9.8; $P=.02$) and in psychological distress secondary to spinal pain (95% CI, 2.7-10.7; $P=.001$). Both measures were rated on a scale of 0 to 100.¹²

A follow-up cost analysis between the usual care and usual care/OMT group found a nonsignificant difference in mean health care costs due to spinal pain for the duration of the study, estimated to be 58 £ (\$88.13 US) in the usual care group and 47 £ (\$71.42 US)

in the OMT group.¹³ Authors of other studies have inferred potential health care cost savings associated with OMT for back pain based on workers' compensation claims, lost work time, provider services, medication use, or length of hospital stay.¹⁴

Evidence basis for OMT in other disorders

Headache

One study randomized 22 subjects with tension-type headaches lasting longer than 6 months to 10-minute sessions of OMT, sham therapy, or supine rest. Participants rated their discomfort on a scale of 0 (absence of headache) to 7 (debilitating headache) before and after study intervention. Only the OMT group showed a significant immediate post-treatment reduction in patient-rated headache severity ($P<.003$).¹⁵

A more recent study examined 26 patients with tension headaches of similar severity and frequency at baseline. All 26 subjects received training in progressive muscular relaxation home exercises, while 14 subjects also received 3 OMT sessions over 3 weeks. At 6 weeks' follow-up, the OMT group noted 1.79 headache-free days per week, compared with 0.21 headache-free days per week in the control group ($P=.016$).¹⁶

Neck pain

Fifty-eight patients with neck pain lasting longer than 3 weeks who sought care at an emergency department were asked to rate their pain intensity on an 11-point numerical scale before and after randomization to receive either 30 mg intramuscular ketorolac or a 5-minute OMT session. Both groups experienced a reduction in pain, 1.7 ± 1.6 (95% CI, 1.1-2.3; $P<.001$) and 2.8 ± 1.7 (95% CI, 2.1-3.4; $P<.002$), respectively. However, patients receiving OMT showed a significantly greater reduction in pain intensity compared with those receiving ketorolac (95% CI, 0.2-1.9; $P=.02$).¹⁷

Otitis media

One study examined the role of OMT in children who had experienced 3 episodes of acute otitis media (AOM) in the 6 months

before study enrollment, or 4 episodes in the prior 12 months. Fifty-seven children ages 6 months to 6 years were randomized to receive usual care or usual care plus 7 OMT sessions over 6 months. The OMT group showed a significantly reduced number of AOM episodes and reduced referral for myringotomy/ventilation tube placement compared with the control group. Additionally, final tympanograms showed an increased frequency of more normal tympanogram types in the OMT group (95% CI, 0.08-1.02; $P=.02$).¹⁸

Pediatric asthma

Using the registry of an asthma clinic, 1 study selected 140 subjects ages 5 to 17 years and randomized them to receive 1 OMT or 1 sham session, with peak expiratory flows (PEF) measured before and after treatment. The OMT group showed a significant mean increase in PEF from 364 to 377 L/min (95% CI, 7.3-18.7) compared with no change in the sham group.¹⁹

In the same year (2005), a Cochrane review analyzed 3 previous trials including 156 children and adults and found no significant difference in lung function measures with OMT or other manipulative or sham treatments.²⁰

Infantile colic

One study randomized 28 infants ages 1 to 12 weeks diagnosed with colic to receive 4 weekly OMT sessions or no treatment. At 4 weeks' follow-up, the OMT group showed a significant reduction in parent-reported daily number of hours their infants spent crying, from 2.39 to 0.89 hours ($P<.001$), and a significant increase in the daily number of hours infants spent sleeping, from 11.55 to 12.9 hours ($P<.002$). The control group showed a nonsignificant reduction in daily number of hours infants spent crying, from 2.06 to 1.56 hours, and a nonsignificant increase in daily number of hours spent sleeping, from 11.86 to 12.04 hours.²¹

IBS, fibromyalgia ...

A number of very small RCTs with equivocal results, pilot studies, and retrospective reviews have investigated the use of OMT in postsurgical functionality, irritable bowel syn-



Patients receiving OMT showed significantly greater reduction in intensity of neck pain compared with those receiving ketorolac.

drome, fibromyalgia, infantile torticollis, muscle spasticity, joint pain, labor pain, back pain during pregnancy, adult asthma, chronic obstructive pulmonary disease, and other medical conditions. Results to date have not been meaningful enough to recommend a place for OMT in the management of these disorders.

Limitations of evidence for OMT

Studies of OMT and other forms of spinal manipulation and manual modalities have been criticized for inconsistent quality.²² Sample sizes of published studies tend to be small, rendering statistical analysis problematic.

Pretrial bias of participants may also influence outcome measures. Patients tend to have preformed opinions regarding the efficacy of manual modalities.²²

The lack of validation of a placebo control has historically been problematic, and the use of sham treatment is an attempt to overcome this.²³ Some studies lack objective parameters for outcomes, relying on subjective patient ratings. Finally, severity of illness in chronic conditions such as back pain varies over time, affecting study results in follow-up.²⁴

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Children prone to recurrent acute otitis media experienced significantly fewer episodes after OMT and usual care than those receiving usual care alone.

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