Table 1: Recommendations of the Agency for Health Care Policy and Research on spinal manipulation for low back problems in adults*

Recommendation	Rating	Level of evidence
Manipulation can be helpful for patients with acute low back problems without radiculopathy when used within the first month of symptoms.	B	Moderate research-based evidence
When findings suggest progressive or severe neurologic deficits, an appropriate diagnostic assessment to rule out serious neurologic conditions is indicated before beginning manipulation therapy.	D	Panel interpretation of information that did not meet inclusion criteria as research-based evidence
There is insufficient evidence to recommend manipulation for patients with radiculopathy.	C	Limited research-based evidence
A trial of manipulation in patients without radiculopathy with symptoms longer than one month is probably safe, but efficacy is unproven.	C	Limited research-based evidence
If manipulation has not resulted in symptomatic improvement that allows increased function after one month of treatment, manipulation therapy should be stopped and the patient re-evaluated.	D	Panel interpretation of information that did not meet inclusion criteria as research-based evidence

*Based on reference 6

pain with OMT. A comprehensive series of subgroup and sensitivity analyses were also performed as part of the meta-analysis. These demonstrated that: (1) OMT provided greater pain reduction than active or placebo control treatments (ES, -0.26; 95% CI, -0.48 – -0.05; P = .02); (2) the effects of OMT were comparable regardless of whether treatment was provided by fully-licensed osteopathic physicians in the United States (ES, -0.31; 95% CI, -0.52 – -0.10; P = .004) or by osteopaths in the United Kingdom (ES, -0.29; 95% CI, -0.58 – -0.00; P = .05); and (3) the effects of OMT increased over time (ES, -0.28; 95% CI, -0.51 – -0.06; P = .02 for short-term treatment [less than one month]; ES, -0.33; 95% CI, -0.51 – -0.15; P < .001 for intermediate-term treatment [one month to less than three months]; ES, -0.40; 95% CI, -0.74 – -0.05; P = .03 for long-term treatment [three months or longer]).

Several important implications derive from these findings. The pain-reducing effects of OMT are significantly greater than those of a placebo or sham treatment. In fact, by comparison with published data, the pain reduction afforded by OMT is comparable to that of non-steroidal anti-inflammatory drugs, including cyclo-oxygenase-2 inhibitors [14], and may potentially last longer than these drugs [15]. With the adverse events known to be associated with non-steroidal anti-inflammatory drugs, and more intense scrutiny of the safety profile of cyclo-oxygenase-2 inhibitors, OMT may offer an attractive alternative to such drugs in many patients with low back pain, particularly those patients requiring ongoing treatment of chronic pain. Finally, for planning purposes, it is important to recognize that previous osteopathic clinical trials have generally been inadequately powered to detect outcomes at the threshold of clinical relevance.

Osteopathic enigmas

Webster's Thesaurus lists the following synonyms for the term "enigma": puzzle, riddle, question, perplexity, conundrum, mystery, secret, and hidden meaning. A cluster of vaginal adenocarcinoma cases among young women at a Boston hospital between 1966 and 1969 represented an enigma, as this type of cancer was rare and unusual in young women [16]. No obvious causal factors were originally identified. The resolution of this enigma was facilitated by the deceptively simple consideration of *in-utero* exposures among the cancer cases. A case-control study then implicated maternal diethylstilbestrol (DES) as the causal factor in subsequent development of vaginal adenocarcinoma in the exposed daughters [16]. Sometimes the resolution of an enigma is much more complex, as evidenced by the "Enigma machine" used by the German military to encode secrets during World War II. The basis for this enigma was the sheer number of possible internal connections within the machine, far surpassing the capability of any individual or small group to decode the information. This enigma was overcome only by the concerted efforts of many cryptanalysts working synergistically with Allied forces throughout the war.

Osteopathic medicine has its enigmas as well. An enigma integral to osteopathic principles involves the complex inter-relationships among the spinal cord, autonomic nervous system, and viscera. Louisa Burns performed animal research in this area in the early 1900s and was the first osteopathic investigator to establish and carry on a long-term research program [17]. J. Stedman Denslow moved the field of osteopathic research forward in the 1940s at the Kirksville College of Osteopathy and Surgery, where he also recruited many able investigators, including Irvin Korr [17]. However, the clinical applications of such research have materialized slowly over time and much remains to be explored at present. The preliminary results of case-control studies at the Osteopathic Research Center have shown significant associations between osteopathic palpatory findings and chronic diseases, including type 2 diabetes mellitus [18] and hypertension [19]. As with the