

in the management of acute and chronic LBP in light of its comparable effectiveness and cost-effectiveness but greater risk of adverse events to patients than other commonly used conservative approaches, including SMT?" Another relevant remaining question postulated by Foster et al<sup>32</sup> is, "Who should be the gatekeepers of patients presenting with musculoskeletal complaints?"

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**Competing interests**

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**Response**

We thank Bussi eres and colleagues for their letter<sup>1</sup> regarding the Tools for Practice article "Spinal manipulative therapy for low back pain."<sup>2</sup>

They make a number of reasonable points. There is no doubt that pharmaceutical agents like nonsteroidal anti-inflammatory drugs and opioids have risks of adverse events (and dependency issues for the latter). The adverse event profile for spinal manipulation therapy (SMT) is not well described or easily determined from the literature but is likely far less than many pharmaceutical agents, particularly in the long term. While the cost-effectiveness of SMT remains unclear, it does not appear to be considerably more costly than any other therapy.

However, these arguments alone do not advocate for SMT. For this, we need unbiased interpretation of high-quality research of effectiveness for pain, function, and other outcomes. As outlined in our article,<sup>2</sup> this is where our primary concern lies. Here are just some of the issues.

- As mentioned, research shows that when the first author of an SMT review was an SMT provider, 4 of 5 reviews were positive, while only 1 review of 17 was positive when the first author was not an SMT provider.<sup>3</sup>

- For our Tools for Practice article,<sup>2</sup> we extracted data from 27 systematic reviews and in our interpretation, 14 were positive and 13 were equivocal or negative. Given that each review has access to a similar array of studies, the heterogeneity in conclusions is surprising. It speaks to how unclear the data are, how easily the results can be modified by selective inclusion, and how interpretation (rather than strong, clear results) drives the final conclusions.
- Weak or low-level evidence is frequently used to support a belief system, even when that research is at high risk of bias. For example, Bussi eres and colleagues<sup>1</sup> report high satisfaction with chiropractic care from a cross-sectional study that has a very high risk of bias.
- Heterogeneity dominates the results of the meta-analyses. Bussi eres and colleagues<sup>1</sup> point to the new systematic review by Paige et al in *JAMA*,<sup>4</sup> published after our final submission of the Tools for Practice article. Paige et al state that SMT showed a “modest” reduction in short-term pain and function.<sup>4</sup> However, what does *modest* mean? This common type of reporting is of little help in making an informed choice. When you examine the actual results, Paige and colleagues report an approximate 10-point improvement in a 100-point visual analogue rating.<sup>4</sup> Not provided on the figure is the heterogeneity of  $I^2=67%$ , suggesting results across studies varied considerably.<sup>4</sup> This could lie in the comparator, but the least effect occurred when the comparator was sham. Sham SMT is likely the weakest comparator and shows these studies should likely have demonstrated the greatest benefits. Furthermore, a sensitivity analysis changing just one study dropped the effect to 8 points out of 100.<sup>4</sup> In addition, Paige et al<sup>4</sup> do not include how many participants have a meaningful change (say, 30% improvement). This is required to understand the results in the context of patient care.
- In a systematic review for acute low back pain (LBP) of 14 studies,<sup>5</sup> SMT was combined with education (n=5), mobilization (n=4), exercise (n=3), modalities (n=3), or medication (n=2). These were then compared with physical modalities (n=7), education (n=6), medication (n=5), exercise (n=5), mobilization (n=3), or sham SMT (n=2). The most common providers of SMT were chiropractors (n=5) and physical therapists (n=5). Most studies (n=6) administered 5 to 10 sessions of SMT over 2 to 4 weeks for acute LBP. Outcomes measured included pain (n=10), function (n=10), health care utilization (n=6), and global effect (n=5). Studies had a follow-up of less than 1 month (n=7), 3 months (n=1), 6 months (n=3), 1 year (n=2), or 2 years (n=1). To sum up, the heterogeneity in research design and outcomes challenges meaningful interpretation of SMT for LBP. This is compounded by the conflicts of interest that permeate the analysis of results and influence conclusions.

We provided the best available evidence without filtered interpretation. It is unfortunate that despite decades of research and practice, the usefulness of SMT remains unclear.

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#### Competing interests

None declared

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