

Chiropractors in the United States Rarely Perform Spinal Manipulation for Chronic Lower Back or Neck Pain When It Is Inappropriate

Millions of Americans suffer from chronic lower back pain (CLBP) and chronic neck pain (CNP). Both are common, but CLBP affects more Americans than any other type of chronic pain. Together, CLBP and CNP cost the health care system over \$86 billion annually and cost employers over \$20 billion annually in lost work.

Chiropractic treatment, which often includes spinal manipulation, has been proven effective in treating CLBP and CNP. Yet studies have identified concerns about whether this treatment is appropriate (safe and effective) for all patients with these conditions. In particular, there is uncertainty and controversy surrounding the use of manipulation for CNP. To date, there is little scientific consensus about the specific clinical scenarios (patient presentations) for which this treatment is appropriate for either condition. In addition, there is a scarcity of data about what proportion of this care received by Americans is appropriate.

To address this knowledge gap, researchers from the RAND Corporation convened expert panels and used the RAND/UCLA Appropriateness Method to determine the appropriateness of spinal and cervical (neck) manipulation for a range of clinical scenarios

associated with CLBP and CNP.¹ Using these results, RAND researchers determined what proportions of chiropractic care delivered for these two conditions were appropriate, inappropriate, or equivocal (uncertain).

Manipulation of the lower back or neck

was defined as controlled, judiciously applied dynamic thrust (adjustment), which could include extension and rotation of the lumbar region (for CLBP) or the cervical region (for CNP) of high or low velocity and low-amplitude (limited range of joint motion) force directed to spinal joint segments within patient tolerance.

Chronic Lower Back Pain: Results of the Expert Panel

The RAND team convened a nine-member expert panel to first define a comprehensive set of clinical scenarios to represent the full range of patients who might present with CLBP and then to rate each

¹ The expert panels also examined spinal mobilization as part of their deliberations; for simplicity, those results are omitted from this brief.

scenario as to the degree to which manipulation was appropriate for those patients.

These scenarios consisted of patient characteristics that a clinician would use when considering appropriate treatment: their history, symptoms, physical and radiographic findings, and response to prior treatment. After eliminating implausible combinations of characteristics, the panel agreed on a set of 900 unique clinical scenarios to rate. The panel then used the RAND/UCLA Appropriateness Method to rate on a 1–9 scale whether spinal manipulation was appropriate (that is, the expected health benefits exceeded the potential negative consequences by enough to be worthwhile) for each scenario. The panel rated each scenario twice. Panelists first rated each scenario based on the available literature summarized by the team and on their own clinical expertise; then, panelists rated each scenario again after discussion with other panelists. The clinical scenarios were organized into sections for ease of rating. Once one (the first) clinical scenario in a section had been rated, the others only differed by one or two patient characteristics and could be evaluated quickly.

Sixty-nine percent of clinical scenarios for chiropractic treatment of CLBP were rated as equivocal. In these scenarios, there was agreement that benefits were roughly equal to the risks, or there was uncertainty as to the relationship between benefits and risks. For the remaining scenarios, manipulation for CLBP was rated appropriate in more scenarios (19 percent) than it was rated inappropriate (12 percent—see Table 1).

Patient characteristics proved useful in predicting appropriateness. For example:

- Manipulation was likely inappropriate for patients with major neurological findings (e.g., patients with progressive unilateral muscle weakness or motor loss).

- Manipulation was less likely to be appropriate for patients with a previous laminectomy (a common spinal surgery).
- Manipulation was more likely to be appropriate for patients with physical findings of joint dysfunction.

Chronic Neck Pain: Results of the Expert Panel

The team convened a similar expert panel to define and rate clinical scenarios for treating CNP with cervical manipulation. For CNP, the RAND team and CNP panelists defined 372 unique clinical scenarios representing the range of patients who could present with this condition. The panelists used the RAND/UCLA Appropriateness Method to rate the appropriateness of manipulation for patients in each scenario.

Manipulation for most scenarios was rated equivocal, but for the rest it was rated inappropriate more often than it was rated appropriate (Table 2).

As with CLBP, patient characteristics proved useful, especially in predicting when manipulation for CNP was inappropriate. Manipulation for patients with “red flags” (fever, cancer, any type of inflammatory arthritis) was always inappropriate, and manipulation was likely to be inappropriate for patients with a prior unfavorable experience with that treatment.

In Practice, Most Manipulation for Chronic Lower Back Pain Was Appropriate

Using the results from the expert panels, researchers calculated how much of the chiropractic care for CLBP

TABLE 1
Ratings for Spinal Manipulation for Chronic Lower Back Pain Across Clinical Scenarios

Rating	Number and Percentage of Scenarios
Appropriate	173 (19%)
Equivocal	621 (69%)
Inappropriate	106 (12%)
Total	900

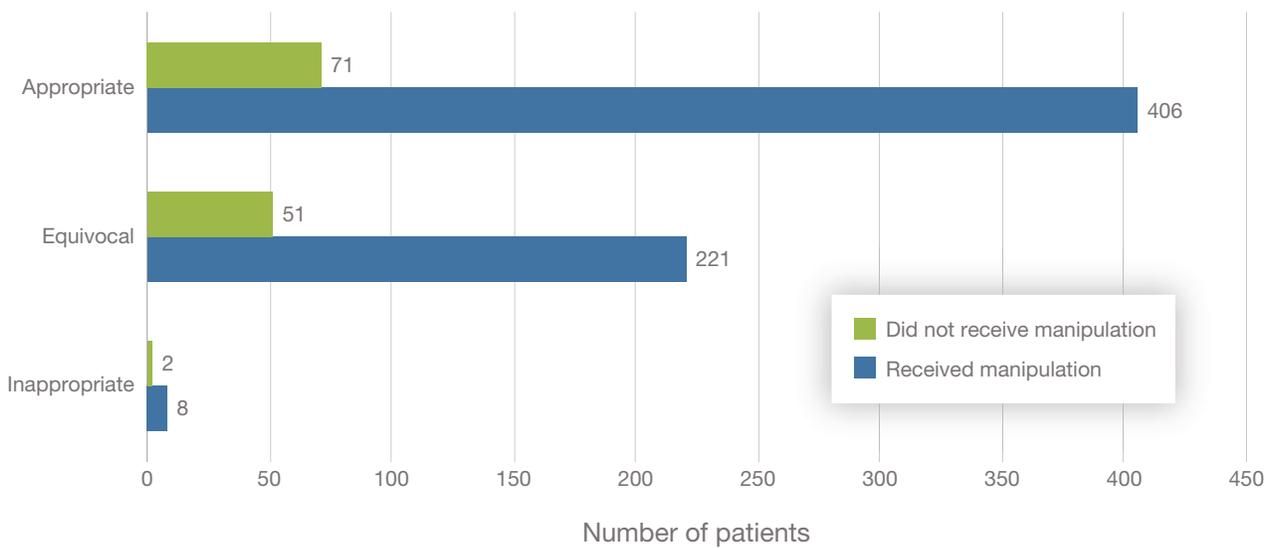
TABLE 2
Ratings for Cervical Manipulation for Chronic Neck Pain Across Clinical Scenarios

Rating	Number and Percentage of Scenarios
Appropriate	42 (11%)
Equivocal	184 (49%)
Inappropriate	146 (39%)
Total	372

delivered in the United States was appropriate. To determine the rate of appropriateness, the researchers identified a sample of clinics, randomly sampled their patient charts, abstracted appropriateness-related patient characteristics from each chart, and used those characteristics to match each patient chart to one of the 900 clinical scenarios and its appropriateness rating. The ratings for each chart were used to calculate the rates of appropriate, inappropriate, and equivocal care. They sampled 759 patients with CLBP (635 of whom were treated with manipulation, 124 of whom were not).

The results showed that, among the 635 patients with CLBP who received manipulation, it was rated as appropriate in most cases (406) and was rated as inappropriate in only eight cases (Figure 1). However, the data also suggest that chiropractors were not generally identifying cases in which manipulation was inappropriate. Of the ten cases in which manipulation was rated as inappropriate, chiropractors engaged in manipulation in eight for them. Nevertheless, chiropractors did apply manipulation less often for patients with certain characteristics. Patients with CLBP who had minor neurologic findings, sciatic nerve irritation, or no joint dysfunction were significantly less likely to receive manipulation. Note that manipulation was also rated as appropriate for most (71 out of 124) patients who did not receive it. In other words, more than half of those who could have benefited from manipulation did not receive it.

FIGURE 1
Most Manipulation for CLBP Patients Was Appropriate, Even in Cases in Which It Was Not Performed



NOTES: A total of 759 records were analyzed from patients with CLBP. 635 received manipulation, and 124 did not. Percentages show fractions for whom care was appropriate, equivocal, or inappropriate within each of these subgroups. There is no statistically significant difference between those who did and did not receive manipulation: *p*-value of 0.369.

Chronic Neck Pain Results Were Mixed

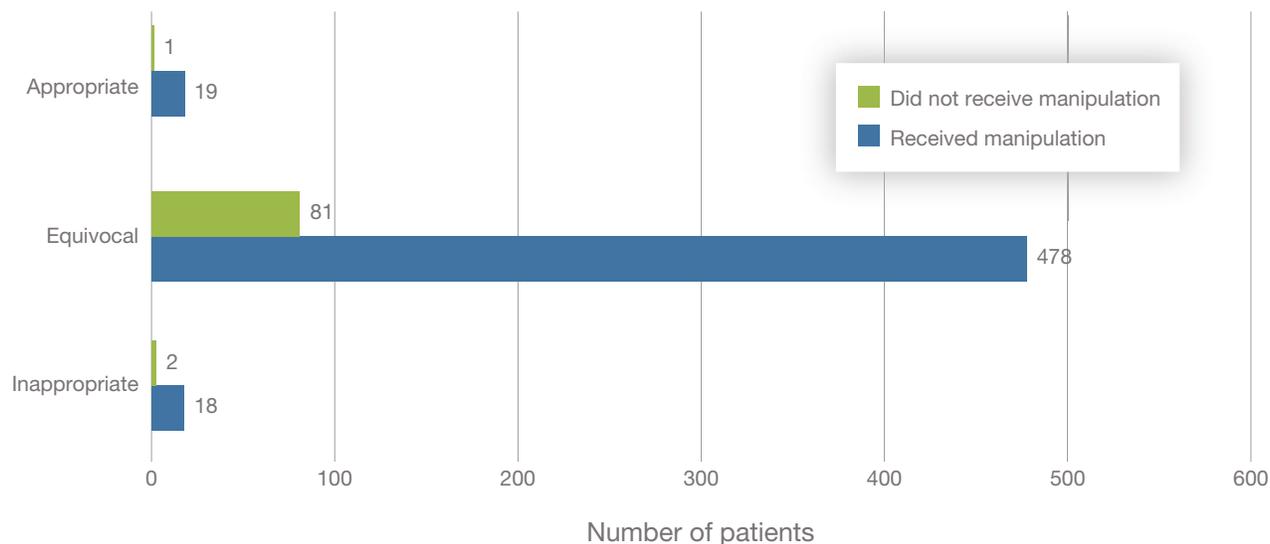
Researchers performed the same analysis on charts from a sample of 599 patients with CNP (515 of whom were treated with manipulation, 84 of whom were not). Possibly reflecting the controversies and uncertainty about chiropractic care for CNP, most CNP patients received manipulation when it was equivocal—that is, it was neither clearly appropriate nor inappropriate (478 cases). Chiropractors saw only 20 CNP patients for whom manipulation was inappropriate, but they performed manipulation in almost all of these cases (18 out of 20) (Figure 2). Chiropractors did apply manipulation significantly less often for patients with CNP who had substantial trauma etiology, no joint dysfunction, or no radiographs.

Conclusions

- Across this sample of patients seen by chiropractors, manipulation was rated as appropriate for most patients with CLBP and as equivocal (uncertain) for most patients with CNP. Chiropractors saw very few patients for whom manipulation was inappropriate.

FIGURE 2

Most Manipulation for CNP Patients Was Equivocal—Not Clearly Appropriate or Inappropriate



NOTES: A total of 599 records were analyzed from patients with CNP. 515 patients received manipulation, and 84 did not. Percentages show fractions for whom care was appropriate, equivocal, or inappropriate within each of these two subgroups. There is no statistically significant difference between those who did and did not receive manipulation: p -value of 0.423.

- Chiropractors applied manipulation in the majority of cases, regardless of its rated appropriateness as determined by the expert panels.
- Nevertheless, chiropractors did apply manipulation significantly less often for patients with certain characteristics associated with inappropriateness.
- There can be good reasons why a clinician would offer a treatment to patients for whom its appropriateness is uncertain, and there is likely more justification for this when the risk of adverse effects is low. However, that the appropriateness of manipulation remains uncertain for large numbers of patients with CNP indicates the need for more research into the benefits and risks of manipulation for this population. Manipulation was appropriate for (and could have benefited) more than half of patients with CLBP who did not receive manipulation.
- This analysis advances understanding of when manipulation for CLBP and CNP is appropriate and when it is not. Clinical guidelines for CLBP and CNP should include information on the clinical scenarios for which manipulation was found inappropriate.
- Further research is needed to determine whether chiropractors were unaware of or disagreed with the criteria that the expert panels used to determine inappropriate care.

This brief describes research conducted in RAND Health Care and documented in Patricia M. Herman, Eric L. Hurwitz, Paul G. Shekelle, Margaret D. Whitley, and Ian D. Coulter, "Clinical Scenarios for Which Spinal Mobilization and Manipulation Are Considered by an Expert Panel to Be Inappropriate (and Appropriate) for Patients with Chronic Low Back Pain," *Medical Care*, Vol. 57, No. 5, May 2019, pp. 391–398 (EP-67874, www.rand.org/t/EP67874); Patricia M. Herman, Howard Vernon, Eric L. Hurwitz, Paul G. Shekelle, Margaret D. Whitley, and Ian D. Coulter, "Clinical Scenarios for Which Cervical Mobilization and Manipulation Are Considered by an Expert Panel to Be Appropriate (and Inappropriate) for Patients with Chronic Neck Pain," *Clinical Journal of Pain*, Vol. 36, No. 4, April 2020, pp. 273–280; and Ian D. Coulter, Patricia M. Herman, Mallika Kommareddi, Eric L. Hurwitz, and Paul G. Shekelle, "Measuring the Appropriateness of Spinal Manipulation for Chronic Low Back and Chronic Neck Pain in Chiropractic Patients," *Spine*, 2021 (published online ahead of print). To view this brief online, visit www.rand.org/t/RBA1018-1. The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark.

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