

Cross KM, Kuenze C, et al. Thoracic Spine Thrust Manipulation Improves Pain, Range of Motion, and Self-Reported Function in Patients With Mechanical Neck Pain: A Systematic Review. J Orthop Sports Phys Ther 2011;41(9):633-642.

Design: Systematic Review of randomized clinical trials (RCTs)

PICOS:

- Population: patients with mechanical neck pain
 - o Patients with neurological deficits, cervicogenic headache, or multiple diagnoses were not included
- Intervention: Thrust manipulation of the thoracic spine
 - o Interventions which included cervical manipulation were excluded
- Comparison: Any comparison group appears to have been eligible; placebo, rest, heat/TENS, cervical mobility exercises were the comparisons selected
- Outcomes: Pain, range of motion (ROM), self-reported function such as Neck Disability Index (NDI), analyzed as change scores from the initial visit to each follow-up interval for each study
- Study types: RCTs published in English

Study selection:

- Databases were PubMed, CINAHL, Cochrane Library, PEDro, Sport Discus, and Web of Science from inception through October 2010
- Two authors independently extracted data and rated the studies for quality using the PEDro 11-item rating tool, which uses criteria similar to the Cochrane Risk of Bias tool
 - o Both assess randomization, allocation concealment, acceptable drop-out rates, and intention-to-treat analysis; both have three items for blinding: patient, provider, and assessor of outcome
 - o Cochrane has an item for similar timing of outcome assessment, for avoidance of selective outcome reporting and for having similar co-interventions; PEDro does not have these items
- Because there were substantial differences between studies with respect to timing of outcome measurements, measurement of pain (e.g., pain at rest versus pain at the end of cervical range of motion), data could not be combined for meta-analysis

Results:

- 6 RCTs met eligibility criteria

- Three types of outcome were reported: pain, ROM, and neck disability
- For all three outcomes, the effect sizes were reported in terms of standardized deviations (SD) using Cohen's d, which is commonly used when results from different studies are reported in different scales, with informal and approximate rules of thumb for what is considered small, medium, and large
 - If d is 0.2 or 0.3 SD, the effect may be considered "small"
 - If d is from 0.3 to 0.8 SD, the effect may be considered "medium"
 - If d is greater than or equal to 0.8 SD, the effect may be considered "large"
- Changes in global pain scores could be obtained for all 6 studies, and the effect sizes, all in favor of thoracic thrust manipulation, expressed as Cohen's d, varied considerably, ranging from 0.38 to 4.03, with all effect sizes whose 95% confidence intervals excluded the null value of 0
 - One study, rather than reporting on global pain scores, reported on pain scores at the end of cervical range of motion, and did not report a statistically significant effect size for treatment with thoracic thrust manipulation
 - ROM scores were also greater for thoracic thrust manipulation, with Cohen's d scores generally large (1.39 to 3.23)
 - Neck disability/function scores, reported in 4 studies, were moderate to large in favor of thoracic thrust manipulation, with Cohen's d scores ranging from 0.47 to 3.64
 - Adverse effects were discussed in only two studies, one of which reported transient (less than 24 hours duration) side effects in both treatment and control groups; the other study reported that adverse effects had not occurred in either group

Authors' conclusions:

- Thoracic spine thrust manipulation reduced pain and improved ROM among patients with acute or subacute mechanical neck pain
- Treatment effects were seen immediately after treatment and continued up to 6 months after treatment
- Chronic pain patients were not included in the available studies; the average duration of symptoms was 3 months or less, indicating acute or subacute pain
- The thoracic thrust technique did not seem to make a difference; the authors of the studies did not explain what led them to choose a specific thrust technique

- The effect size was greater when the comparison intervention was a placebo or passive intervention and was less when the comparison was an exercise program, indicating that exercise has a treatment effect of its own
- Most studies had short times of follow-up; only one study had six months of posttreatment evaluation
- Thoracic spine manipulation may be a treatment option in patients with mechanical neck pain, especially if cervical thrust manipulation is contraindicated or if the patient does not want it

Comments:

- The authors are correct to note that the positive results should be interpreted with caution
 - o The follow-up times were short: in 2 studies, the results were obtained immediately after treatment; in one study, the results were obtained 2 to 4 days after treatment; in only one study was there a 6 month follow-up
 - o However, in the study with the longest follow-up time, there appear to be nearly identical effects on self-reported function at 1 week, 4 weeks, and 6 months (Figure 5)
 - o For the same study, the effects on pain relief at 4 weeks and 6 months are very similar (Figure 3)
- Another limitation also noted by the authors is that there are few studies in completely independent populations; the 6 RCTs had only 3 different lead authors
- Figures 3 and 5 also illustrate the relationship between effect size and comparison intervention that the authors touched on in the text
 - o The studies with very large effect sizes (more than 2 SD difference between thrust and control groups) had heat/TENS as the comparison intervention; the study in which the control group had an exercise program had moderate effect sizes (around 0.5 SD difference between thrust and control)
- Overall, the most appropriate interpretation of the systematic review may be to focus on the single study (Cleland 2010) with the most relevant (cervical exercise program alone) comparison, and to ignore the studies listed in Table 1 with immediate and very short follow-up times and passive intervention comparisons

Assessment: Adequate for evidence that a program of 2 sessions of thoracic thrust manipulation followed by a cervical exercise program is more effective in reducing pain and disability than a cervical exercise program alone

Reference:

Cleland JA, Mintken PE et al . Examination of a Clinical Prediction Rule to Identify Patients With Neck Pain Likely to Benefit From Thoracic Spine Thrust Manipulation and a General Cervical Range of Motion Exercise: Multi-Center Randomized Clinical Trial. *Phys Ther* 2010;90:1239-1250.