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[Intervention Review]

# Manipulation and mobilisation for neck pain contrasted against an inactive control or another active treatment

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## **ABSTRACT**

#### **Background**

Manipulation and mobilisation are commonly used to treat neck pain. This is an update of a Cochrane review first published in 2003, and previously updated in 2010.

#### **Objectives**

To assess the effects of manipulation or mobilisation alone compared wiith those of an inactive control or another active treatment on pain, function, disability, patient satisfaction, quality of life and global perceived effect in adults experiencing neck pain with or without radicular symptoms and cervicogenic headache (CGH) at immediate- to long-term follow-up. When appropriate, to assess the influence of treatment characteristics (i.e. technique, dosage), methodological quality, symptom duration and subtypes of neck disorder on treatment outcomes.

# **Search methods**

Review authors searched the following computerised databases to November 2014 to identify additional studies: the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). We also searched ClinicalTrials.gov, checked references, searched citations and contacted study authors to find relevant studies. We updated this search in June 2015, but these results have not yet been incorporated.

## **Selection criteria**

Randomised controlled trials (RCTs) undertaken to assess whether manipulation or mobilisation improves clinical outcomes for adults with acute/subacute/chronic neck pain.



#### **Data collection and analysis**

Two review authors independently selected studies, abstracted data, assessed risk of bias and applied Grades of Recommendation, Assessment, Development and Evaluation (GRADE) methods (very low, low, moderate, high quality). We calculated pooled risk ratios (RRs) and standardised mean differences (SMDs).

#### **Main results**

We included 51 trials (2920 participants, 18 trials of manipulation/mobilisation versus control; 34 trials of manipulation/mobilisation versus another treatment, 1 trial had two comparisons).

**Cervical manipulation versus inactive control:** For subacute and chronic neck pain, a single manipulation (three trials, no meta-analysis, 154 participants, ranged from very low to low quality) relieved pain at immediate- but not short-term follow-up.

Cervical manipulation versus another active treatment: For acute and chronic neck pain, multiple sessions of cervical manipulation (two trials, 446 participants, ranged from moderate to high quality) produced similar changes in pain, function, quality of life (QoL), global perceived effect (GPE) and patient satisfaction when compared with multiple sessions of cervical mobilisation at immediate-, short- and intermediate-term follow-up. For acute and subacute neck pain, multiple sessions of cervical manipulation were more effective than certain medications in improving pain and function at immediate- (one trial, 182 participants, moderate quality) and long-term follow-up (one trial, 181 participants, moderate quality). These findings are consistent for function at intermediate-term follow-up (one trial, 182 participants, moderate quality). For chronic CGH, multiple sessions of cervical manipulation (two trials, 125 participants, low quality) may be more effective than massage in improving pain and function at short/intermediate-term follow-up. Multiple sessions of cervical manipulation (one trial, 65 participants, very low quality) may be favoured over transcutaneous electrical nerve stimulation (TENS) for pain reduction at short-term follow-up. For acute neck pain, multiple sessions of cervical manipulation (one trial, 20 participants, very low quality) may be more effective than thoracic manipulation in improving pain and function at short/intermediate-term follow-up.

**Thoracic manipulation versus inactive control:** Three trials (150 participants) using a single session were assessed at immediate-, short-and intermediate-term follow-up. At short-term follow-up, manipulation improved pain in participants with <u>acute and subacute neck pain</u> (five trials, 346 participants, moderate quality, pooled SMD -1.26, 95% confidence interval (CI) -1.86 to -0.66) and improved function (four trials, 258 participants, moderate quality, pooled SMD -1.40, 95% CI -2.24 to -0.55) in participants with <u>acute and chronic neck pain</u>. A funnel plot of these data suggests publication bias. These findings were consistent at intermediate follow-up for pain/function/quality of life (one trial, 111 participants, low quality).

**Thoracic manipulation versus another active treatment:** No studies provided sufficient data for statistical analyses. A single session of thoracic manipulation (one trial, 100 participants, moderate quality) was comparable with thoracic mobilisation for pain relief at immediate-term follow-up for chronic neck pain.

**Mobilisation versus inactive control:** Mobilisation as a stand-alone intervention (two trials, 57 participants, ranged from very low to low quality) may not reduce pain more than an inactive control.

**Mobilisation versus another active treatment:** For acute and subacute neck pain, anterior-posterior mobilisation (one trial, 95 participants, very low quality) may favour pain reduction over rotatory or transverse mobilisations at immediate-term follow-up. For chronic CGH with temporomandibular joint (TMJ) dysfunction, multiple sessions of TMJ manual therapy (one trial, 38 participants, very low quality) may be more effective than cervical mobilisation in improving pain/function at immediate- and intermediate-term follow-up. For subacute and chronic neck pain, cervical mobilisation alone (four trials, 165 participants, ranged from low to very low quality) may not be different from ultrasound, TENS, acupuncture and massage in improving pain, function, QoL and participant satisfaction at immediate- and intermediate-term follow-up. Additionally, combining laser with manipulation may be superior to using manipulation or laser alone (one trial, 56 participants, very low quality).

# **Authors' conclusions**

Although support can be found for use of thoracic manipulation versus control for neck pain, function and QoL, results for cervical manipulation and mobilisation versus control are few and diverse. Publication bias cannot be ruled out. Research designed to protect against various biases is needed.

Findings suggest that manipulation and mobilisation present similar results for every outcome at immediate/short/intermediate-term follow-up. Multiple cervical manipulation sessions may provide better pain relief and functional improvement than certain medications at immediate/intermediate/long-term follow-up. Since the risk of rare but serious adverse events for manipulation exists, further high-quality research focusing on mobilisation and comparing mobilisation or manipulation versus other treatment options is needed to guide clinicians in their optimal treatment choices.

# PLAIN LANGUAGE SUMMARY

Manipulation and mobilisation for neck disorders



#### **Review question**

This update assessed the effect of manipulation or mobilisation alone compared with a control or another treatment on pain, function, disability, patient satisfaction, quality of life and global perceived effect in adults experiencing neck pain with or without arm symptoms and headache at immediate- to long-term follow-up.

#### **Background**

Neck pain can cause varying levels of disability for the affected individual and is a common musculoskeletal complaint. Neck pain can be accompanied by pain radiating down the arms (radiculopathy) or by headache (cervicogenic headache). Manipulation (adjustments to the spine) and mobilisation (movement imposed on joints and muscles) can be used alone or in combination with other physiotherapies to treat neck pain.

#### **Study characteristics**

This updated review includes 51 trials: 18 trials contrasted manipulation or mobilisation against no treatment or pretend treatment; 34 trials compared manipulation or mobilisation against another treatment (electrotherapy, exercise, medication) and various techniques or dosages. [Note one trial included two comparison groups].

#### **Key results**

Although other reviews focusing on adverse events suggest that mobilisation is safe and manipulation may result in rare but serious side effects such as stroke, disc herniation or serious neurological deficits, our review noted temporary and benign side effects with both approaches; more than half of the included trials did not report on adverse effects.

- Manipulation or mobilisation versus inactive treatment: For subacute/chronic neck pain, a single manipulation produced temporary pain relief. However, conflicting evidence was found at short-term follow-up for pain reduction with multiple sessions. At short-term and intermediate-term follow-up, multiple sessions of thoracic manipulation were favoured for pain reduction among participants with acute/ subacute neck pain, and for functional improvement among those with acute to chronic neck pain. No additional pain relief was reported when thoracic mobilisation was used.
- Manipulation or mobilisation versus another active treatment: Cervical manipulation produced changes in pain, function, quality of life, global perceived effect and patient satisfaction that were comparable with those attained with cervical mobilisation up to intermediate-term follow-up for patients with neck pain of any duration. Cervical manipulation for acute/subacute neck pain was more effective than varied combinations of analgesics, muscle relaxants and non-steroidal anti-inflammatory drugs for improving pain and function at up to long-term follow-up. For chronic cervicogenic headache, cervical manipulation provided greater benefit than light massage in improving pain and function at short-term and intermediate-term follow-up. For chronic CGH, cervical manipulation may be superior to transcutaneous electrical nerve stimulation (TENS) in improving pain at short-term follow-up. For acute neck pain, cervical manipulation may be more effective than thoracic manipulation in improving pain and function up to intermediate-term follow-up. Finally, for subacute and chronic neck pain, cervical mobilisation appeared similar to pulsed ultrasound, TENS, acupuncture and massage in improving pain, function, quality of life and patient satisfaction up to intermediate-term follow-up. However, combining laser with manipulation may be superior to using manipulation or laser alone.

# Quality of the evidence

No high-quality evidence was found, so uncertainty about the effectiveness of mobilisation or manipulation for neck pain remains. Future research is likely to have an important impact on the effect estimate. Authors of this review encountered many challenges, for example, the number of participants in most trials was small, 80% (41/51) of the included studies were of low or very low quality and evidence on the optimum dosage requirement was limited.