

# Is manual physical therapy more effective than other physical therapy approaches in reducing pain and disability in adults post whiplash injury?

## **Clinical Bottom Line**

Manual therapy may have a role in the early management of whiplash for reducing pain intensity. In chronic whiplash manual therapy may reduce pain and when combined with exercise manual therapy may improve function and reduce long-term pain when compared with manipulation alone. Active patient involvement and McKenzie approaches are less costly and more effective than standard advice leaflets in terms of resources related to physiotherapy.

## **Criteria for Critically Appraised Topic**

### ***Population:***

Male and female adults – 18 years and over

History of whiplash injury, motor vehicle accident, whiplash associated disorder

Acute, sub acute and chronic

### ***Intervention:***

Manual therapy includes any of the techniques listed below used alone or in combination:

- Mobilisation(s)
- Manipulation
- McKenzie (hands on techniques)
- Massage
- Active/passive mobilisations/movements
- Soft tissue techniques
- Postural correction/stabilisation techniques

### ***Comparison:***

Other physical therapies include:

- No treatment
- Traction
- Usual care, GP care
- Advice and education
- Exercise, home exercise programme – stretching and strengthening
- Exercise or position based McKenzie (hands off techniques)
- Electrotherapy (ultrasound, laser, shortwave diathermy, interferential therapy, Transcutaneous Electrical Nerve Stimulation, infrared)
- Thermotherapy (ice, warmth, hot packs)
- Acupuncture
- Hydrotherapy
- Rest (collars)
- Cognitive behavioural therapy

### ***Outcomes:***

#### ***Primary Outcomes:***

- Reduced neck pain
- Reduced neck disability

**Secondary outcomes:**

- Improved quality of life
- Reduction in neck stiffness
- Satisfaction with treatment
- Improvement in neck range of movement (flexion, extension)
- Activities of daily living
- Participation (work, leisure)
- Medication use
- Consultation

**Inclusions:**

Neck, pain, whiplash, whiplash injuries, whiplash trauma, whiplash associated disorder, motor vehicle accident, acceleration-deceleration injury, cervical spine, soft tissue injury, referred arm pain, automobile crashes, disability, function

**Exclusions:**

Fractures, surgical interventions, children, cadaver studies

**Databases Searched:** Cochrane, Pedro, Medline, Amed, Cinahl, Embase, PsychInfo, Clinical Evidence, Bandolier, NELH, Professional websites, Clinical Guidelines, NICE,

**Types of study:**

- Systematic reviews
- Randomised Controlled Trials (RCTs)
- Guidelines
- English language

**Key words searched:**

Acceleration-deceleration injury,

Active Movement

Active/passive mobilisations/movements

Acupuncture

Acute, sub acute and chronic

Advice and education

Automobile crashes

Cervical spine

Cognitive behavioural therapy

Coping

Disability

Electrotherapy (ultrasound, laser, shortwave diathermy, interferential therapy, Transcutaneous

Electrical Nerve Stimulation, infrared)

English language

Exercise, home exercise programme – stretching and strengthening

Function

GP care

Guidelines

Hydrotherapy

Manipulation

Massage

McKenzie techniques

Mobilisation(s)

Motor vehicle accident

Neck

Pain  
 Passive Movement  
 Patient Satisfaction  
 Physical Therapy  
 Physiotherapy  
 Postural correction/stabilisation techniques  
 Randomised Controlled Trials (RCTs)  
 Range of Movement  
 Referred arm pain  
 Rest (collars)  
 Soft tissue injur  
 Soft tissue techniques  
 Strength  
 Systematic reviews  
 Thermotherapy (ice, warmth, hot packs)  
 Traction  
 Usual care  
 Whiplash associated disorder  
 Whiplash injuries  
 Whiplash trauma  
 Whiplash  
 Whiplash-associated disorders

***Time Frame:***

Past 10 years i.e. 1996 – September 2006.

**Available Evidence**

<b>Database</b>	<b>Number of relevant abstracts</b>
<b>Clinical evidence</b>	<b>0 unique</b>
<b>PsychInfo</b>	<b>0 unique</b>
<b>Embase</b>	<b>162</b>
<b>PEDRO</b>	<b>16</b>
<b>Medline</b>	<b>155</b>
<b>Cochrane</b>	<b>2</b>
<b>Clinical evidence</b>	<b>0 unique</b>
<b>Professional websites</b>	<b>1</b>
<b>Total</b>	<b>336</b>

## **Results:**

40 abstracts were reviewed by two members of the group who assessed the relevance to the CAT question. 10 documents were highlighted that potentially could answer the CAT question. It was agreed to preliminarily include papers in order to further assess their relevance and quality. Finally, five documents were included, two of them referred to the same study (Rosenfeld et al 2003; 2006).

1. Baltaci et al (2003) was excluded as this was an outcome report following treatment and was not randomised.
2. Schnabel et al (2004) was excluded as the comparison was collars versus exercise therapy.
3. Lundmark and Persson (2006). This was a systematic search and review of physiotherapy in early whiplash. This review was limited in terms of its quality (no quality evaluation of studies) and narrow search terms. Four studies were identified within the review that addressed the question. McKinney et al (1989), Mealy et al (1986) and Rosenfeld et al (2000 & 2003). The review article was consequently excluded, as the four papers identified within it have been considered by the Chartered Society of Physiotherapy Clinical Guidelines for the physiotherapy management of whiplash associated disorders.
4. Rosenfeld et al (2006) was included, as this was published after the guidelines and is a health economics analysis of a trial of manual therapy for whiplash.
5. The final document considered was the CSP Clinical Guidelines for the Management of Whiplash Associated Disorder.
6. Rosenfeld et al (2003). This paper refers to the same study as the paper by Rosenfeld et al (2006).
7. Seferiadis et al (2004). This was a systematic review of treatment interventions in general in whiplash associated disorders. This review does not answer the CAT question and therefore it was excluded.
8. Verhagen et al (2006). This was a Cochrane systematic review assessing the effectiveness of conservative treatment in patients with WAD Grade 1 or 2. Although a part of the review focused on trials comparing different forms of conservative treatment including manual therapy, it does not answer the research question and it was excluded.
9. Conlin et al (2005). This was systematic review.
10. De las Penas et al (2004). This was a RCT and it was included since it was particularly relevant to the CAT question.

**Rosenfeld M, Seferiadis, Gunnarsson. Active involvement and intervention in patients exposed to whiplash trauma in automobile pressures reduces costs. A randomised controlled clinical trial and health economic evaluation *Spine* 2006, 31, 1799-1804.**

The aim of this study was to compare the costs of an active involvement and intervention that included McKenzie approaches to treatment versus a standard intervention and relate them to the clinical effects in patients exposed to whiplash trauma in automobile crashes to facilitate decision making regarding intervention and resource allocation of these patients.

This paper complements the main study by Rosenfeld et al. (2003). Patients were randomised to one of four treatment groups:

- Active treatment within 96 hours following collision
- Standard treatment within 96 hours
- Active treatment with a delay of 14 days
- Standard treatment with a delay of 14 days

The active treatment included active exercise, incorporating early and repeated movements based on Salter's work on continuous passive motion and components consistent with McKenzie treatments. The active treatments consisted of two phases: i) an initial phase of information, postural control and neck rotation exercises and ii) if symptoms persisted evaluation and treatment according to McKenzie. The standard treatment included written information in a leaflet on injury mechanisms, advice on suitable activities and postural correction (see Rosenfeld et al 2003).

The main outcomes were change in pain intensity measured on a visual analogue scale, change in neck range of movement and number of sick leave days in the previous six months. Assessments were taken at baseline, 6 months and 3 years.

The health economic evaluation was limited to health resources consumed in relation to physiotherapy treatments. Therefore important information such as visits to the general practitioner or specialist appointments was not included. This is a limitation of the analysis. Total sick leave was calculated by adding part-time and full-time sick leave at the 6 month and 3 year follow-ups. There was 91% follow-up at 6 months and 75% at 3 years. The average number of treatments was 3.95. Persistent symptoms more than 20 days were seen in 27 of 43 patients (63%). Participants were subsequently re-examined and treated with mechanical diagnosis and McKenzie. At both 6 months and 3 years there was a statistically significant improvement in reduction of pain intensity in the active treatment versus the standard treatment group. Total

costs for all patients were statistically significant in the active treatment group at 6 months and 3 years.

There was no measure of neck pain disability in the study.

The active treatment intervention did not initially include any hands-on techniques or passive methods to emphasise the patient's own key role. The physiotherapists only examined, informed and instructed the patient on self-treatment in a home exercise programme.

The study conclusion was that active involvement and intervention is a cost saving alternative compared to standard intervention in patients with whiplash, when costs are related to physiotherapy treatment and productivity. Therefore active treatment was both less costly and more effective than the standard approach.

### **CSP Clinical Guidelines for the Physiotherapy Management of Whiplash Associated Disorder**

Guidelines can be appraised using the AGREE instrument. During the production of the CSP Guidelines the Guideline Development Group referred regularly to the AGREE instrument. Manual physical therapy was considered for acute (0-2 weeks after whiplash), sub-acute (2-12 weeks after whiplash) and chronic (more than 12 weeks after whiplash) whiplash associated disorders. The Yorkshire Guidelines Group originally searched for literature in 1996. Further literature searches were carried out in Brighton in 2001. Further updates were undertaken in July 2002 and March 2004 by the CSP systematic reviewer. The search strategies are detailed in Appendix B of the document. This will be updated in 2010.

'Manual mobilisation versus initial rest and a soft collar'.

There was poor quality evidence to suggest early manual mobilisation reduces levels of pain more than initial rest. A Delphi technique was used throughout to gauge consensus on evidence recommendations. There was consensus for early manual mobilisation being more effective than a soft collar in improving neck range of movement, and early manual mobilisation being more effective than initial rest in improving function.

'Early exercise and advice versus initial rest and soft collar'

The study by Rosenfeld et al (2003) evaluating McKenzie approaches was considered under this evidence statement. They concluded that there was greater reduction of pain intensity at 6 months after active treatment and posture advice consistent with McKenzie principles than standard advice leaflets. There was no difference between active treatment and standard treatment in improving range of movement within 96 hours of injury. Early treatment was within

96 hours. Active exercise was more effective in reducing pain if administered within 96 hours of injury.

'Combined manipulation and manual mobilisation may reduce pain and improve function in sub-acute whiplash'

The evidence statement for sub-acute whiplash was based on the Delphi consensus alone, where 52% of participants agreed with the evidence statement.

There is an evidence statement on the adverse effects from cervical manipulation. For mechanical neck pain the serious risk of adverse events from cervical manipulation is low. However, a history of whiplash is a risk factor for vascular accidents following cervical manipulation.

A final evidence statement on manual therapy for chronic whiplash was based on the Delphi process alone. There was consensus that manual mobilisation may reduce pain and that manipulation and exercise may be more effective than manipulation alone in improving function and reducing long term pain. There was agreement that combined manipulation and manual mobilisation may reduce pain, that manipulation may reduce pain, that combined manipulation and manual mobilisation may improve function and manipulation and exercise may be more effective than manipulation alone in improved patient satisfaction.

**Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash associated disorders. Part I: Non-invasive interventions. Pain Res Manage 2005, 10 (1): 21-32.**

The objective of this review was to provide a systematic review of the literature published between January 1993 and July 2003 on noninvasive interventions for WAD using meta-analytical techniques. Eight RCTs were included in the review. Conlin et al (2005) concluded that exercise alone does not improve ROM in patients with acute WAD and that mobilization is recommended for the treatment of pain and compromised cervical range of motion in the acute WAD patient.

**De las Penas CF, Fernandez-Carnero J, Palomeque del Cerro L, Miangolarra-Page JC. Manipulative treatment vs. conventional physiotherapy treatment in whiplash injury: A randomized controlled trial. Journal of whiplash & related disorders 2004, 3 (2): 73-90.**

The aim of this study was to compare manual therapy techniques (spinal mobilization, spinal manipulation and soft tissue manipulation) to “conventional physiotherapy” which included active exercises, ultrasound and diathermy. 380 patients diagnosed with acute whiplash injury of less

than three months duration were included and randomized to two groups; the manipulative group and the physiotherapy group.

Patients in the manipulative group needed fewer sessions to complete the treatment than patients who received physiotherapy. Furthermore the manipulative group had a statistically significant reduction in pain ( $P=0.002$ ) and an improvement of cervical rotation ( $P=0.02$ ). The RCT was of a low methodological quality and therefore its results should be interpreted cautiously. Additionally, de las Penas et al (2004) stated that the conventional physiotherapy techniques were chosen in the light of scientific evidence and best practice but this was not demonstrated.

#### **Further research question**

Is manual physical therapy used in conjunction with exercise more effective than exercise alone in reducing pain and disability in adults post whiplash injury?

#### **References**

Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash associated disorders. Part I: Non-invasive interventions. *Pain Res Manage* 2005, 10 (1): 21-32.

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Rosenfeld M, Seferiadis A, Carlsson J, Gunnarsson R. Active intervention in patients with whiplash associated disorders improves long term prognosis. A randomised controlled clinical trial. *Spine* 2003, 28, 2491-2498.

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