The effectiveness of manual therapy in the management of musculoskeletal disorders of the shoulder: a systematic review
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CRD summary
The authors concluded that manual therapy was no more effective than other interventions for shoulder dysfunction, but massage and mobilisations may be useful for non-specific shoulder dysfunction in the short term. These conclusions reflected the evidence, but should be interpreted with caution due to the quality of evidence available and the possibility that additional relevant studies may have been missed.

Authors' objectives
To summarise existing evidence on the effectiveness of manual therapy in the management of musculoskeletal disorders of the shoulder.

Searching
PubMed, MEDLINE, CINAHL, AMED, EMBASE and PEDro were searched to January 2007 for articles in English or German. Search terms were reported. Reference lists of retrieved articles were checked for relevant studies. Three manual therapy journals were handsearched.

Study selection
Randomised controlled trials (RCTs) of participants who received at least one application of manual therapy for disorders of the shoulder (including fractures, dislocations, degenerative/osteoarthritis and orthopaedic surgery) were eligible for inclusion. Studies that applied manual therapy to the shoulder girdle, cervical or thoracic spine were included. Multi-modal interventions were included if manual therapy could be extracted from the other interventions. Studies had to report pain, range of motion, functional outcomes, patient satisfaction or recovery rates. Studies were excluded if they were in participants with rheumatoid arthritis, had shoulder symptoms of spinal origin or had neurological disorders such as stroke.

Included studies were in participants with adhesive capsulitis, shoulder impingement syndrome, or non-specific shoulder pain or dysfunction. Manual therapy interventions included Maitland joint mobilisations of the shoulder girdle, mobilisation of the upper quarter, manipulation and soft tissue massage. Studies that assessed manual therapy in isolation or in combination with other interventions (exercise, hot packs or medical care) were included. Control group interventions included exercise, stretching and no treatment. Mean age of participants ranged from 44 to 65 years.

Two authors independently performed the study selection. Disagreements were resolved through consultation with a third reviewer.

Assessment of study quality
Trial quality was assessed using the PEDro scale of 10 quality factors such as randomisation, allocation concealment, blinding and intention to treat.

Two authors performed the validity assessment. Disagreements were resolved through consensus or consultation with a third reviewer.

Data extraction
Data on pain outcomes, functional outcomes and range of motion pain were converted to mean differences with 95% confidence intervals (CIs) or relative risks with 95% CIs where the data were dichotomous. Data were extracted for outcomes immediately following the intervention period (initial follow-up) and, where available, at the final follow-up period (long-term follow-up).
Methods of synthesis
A qualitative analysis was undertaken using levels of evidence to determine treatment effectiveness. Evidence was considered strong if there were several high quality RCTs with consistent findings, moderate if there were several low quality RCTs with consistent findings and limited if there was only one RCT. The studies were grouped according to type of shoulder dysfunction.

Results of the review
Fourteen RCTs (n=888) were included in the review. Study size ranged from 14 to 172 participants. Follow-up ranged from three days to four years. PEDro scores ranged from 3 out of 10 to 8 out of 10. Eight RCTs scored at least 6 out of 10. The main quality issues with the included studies were lack of blinding, lack of allocation concealment and a lack of intention to treat.

Adhesive capsulitis (six studies): There was moderate evidence that manual therapy was no more effective at decreasing pain and improving range of motion and functional outcomes compared with other treatments. There was moderate evidence that high grade manual therapy was superior to low grade manual therapy in terms of range of motion and long-term functional outcomes.

Shoulder impingement syndrome (three studies): There was no evidence that manual therapy was more effective than other interventions.

Non-specific shoulder pain or dysfunction (five studies): There was moderate evidence that manual therapy increased range of motion in the short term when compared to sham or control interventions, and that massage was effective compared with no treatment. There was moderate evidence that manual therapy was no more effective at improving long-term function compared with other interventions.

Authors' conclusions
Manual therapy was not shown to be more effective than other interventions for adhesive capsulitis or shoulder impingement syndrome. Massage and mobilisations with movement may be useful for non-specific shoulder dysfunction in the short-term when compared to no treatment.

CRD commentary
Inclusion criteria in terms of study design, intervention and participants were clearly stated, although eligible comparator groups were not clearly defined. Several relevant data sources were searched. The restriction to published literature in English and German may have caused relevant studies to missed. There was no assessment of publication bias. The authors conducted study selection and validity assessment in duplicate. Data extraction was performed by only one reviewer and it was unclear whether data were checked, which may have introduced bias and error into the review. Study validity assessment was undertaken with a validated tool; most of the included RCTs were of moderate quality. A narrative synthesis was undertaken as studies were deemed too disparate for meta-analysis, which seemed appropriate. The authors' conclusion that manual therapy was no more effective than other therapies reflected the evidence presented, but should be interpreted with come caution as the results were based on a few predominantly small studies and the possibility of publication and language biases meant that additional relevant studies may have been missed.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that more high-quality RCTs of manual therapy with standardised definitions of shoulder diagnosis, clear descriptions of treatment and adequate follow-up and sample size were needed.

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