CRD summary
This review examined the effectiveness of conservative treatments (excluding surgery, splints, shock wave therapy or casts) for lateral epicondylitis (‘tennis elbow’). The authors concluded that several interventions had positive effects on pain and function, but there was a lack of evidence on their relative effectiveness. Although the quality of the evidence varied between interventions, these conclusions generally appear reliable.

Authors' objectives
To determine the effectiveness of conservative rehabilitation treatments for lateral epicondylitis.

Searching
MEDLINE, CINAHL, EMBASE, PEDro and the Cochrane CENTRAL Register were searched from January 1983 to March 2003; the search terms were reported. The search was restricted to English language material. The authors also handsearched bibliographic references (no further details given).

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and quasi-RCTs were eligible for inclusion.

Specific interventions included in the review
Conservative interventions for lateral epicondylitis were eligible for inclusion. Studies of surgery, splints, shock wave therapy or casts were excluded. Studies of ultrasound, acupuncture, Rebox (0 to 300 microamperes electrical therapy), wait and see, exercise, ionisation, pulsed electromagnetic fields, mobilisation and manipulation, and laser therapy were included.

Participants included in the review
The participants were adults aged over 18 years with lateral epicondylitis. All of the included studies that reported gender had both male and female participants. The duration of symptoms varied widely between and within studies, the widest range within a study being 1 to 120 months. The mean age of the participants, where reported, was typically 30 to 50 years.

Outcomes assessed in the review
No inclusion or exclusion criteria relating to the outcomes were specified. The outcomes evaluated in the included studies included measures of pain, function, grip strength, lifting, mobility, physical force, self-rated improvement, and the resumption of work or leisure activities.

How were decisions on the relevance of primary studies made?
Five independent reviewers examined the titles and abstracts of studies identified by the literature search. All studies classed as relevant by at least one reviewer were retrieved. The full articles were then examined, as part of the process of assessing validity, to ensure that they met the inclusion criteria.

Assessment of study quality
Validity was assessed using a published checklist developed by Dr. J MacDermid. The checklist comprised 23 items relating to design, participants, intervention, outcomes and analysis. Each study was also assigned a level of evidence using the scheme developed by Sackett. Two independent reviewers assessed the studies for validity. Any disagreements were resolved by consensus and, if necessary, by consulting a third reviewer.
**Data extraction**
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

The results were presented as reported by the authors of the original studies, and P-values (if available) were given for all outcomes. Data on return to work, non-response and complications were extracted, where available, or shown as not reported.

**Methods of synthesis**

**How were the studies combined?**
The studies were grouped by type of intervention in the text and tables.

**How were differences between studies investigated?**
Differences between the studies in terms of participants (age, gender and duration of symptoms), interventions and comparators, and outcomes evaluated were tabulated and briefly discussed in the text.

**Results of the review**
Thirty-one studies with 1,666 participants were included in the review. Of these, 5 studies (215 participants) were rated as level 1b studies (individual RCT with narrow confidence interval) and 26 (1,451 participants) were rated as level 2b studies (individual cohort study or low-quality RCT).

The following interventions were more effective than comparators (based on at least one level 2b study) for reducing pain and/or improving function in patients with lateral epicondylitis: acupuncture, exercise therapy, manipulations and mobilisations, ultrasound, phonophoresis, Rebox, and ionisation with diclofenac. Six studies showed that laser therapy was no more effective than placebo laser therapy. One study of pulsed electromagnetic field therapy found that this intervention was no more effective than placebo.

**Authors’ conclusions**
There was evidence to support the effectiveness of a number of interventions for the management of patients with lateral epicondylitis. The available evidence also suggested that laser therapy and pulsed electromagnetic fields are ineffective. Methodological weaknesses in the studies and a lack of direct comparisons made it difficult to determine an optimal treatment approach.

**CRD commentary**
The review question was clearly stated, but the range of interventions eligible for inclusion was not clearly defined; some interventions were, however, explicitly excluded. The authors searched a range of relevant sources, although the restriction to English language material raises the possibility of language or publication bias. At least two independent reviewers selected the studies and assessed validity, thus minimising the risk of bias or errors in the review process. The results of the validity assessment were taken into account in the review.

Relevant details of the primary studies were presented in the text and tables. It was unclear how many reviewers extracted the data, so it is difficult to comment on this aspect of the review. The narrative synthesis was limited to a summary of the results of each included study. The authors’ conclusion, that there was a lack of good quality evidence to guide treatment choice in this area, appears reliable.

**Implications of the review for practice and research**
Practice: The authors stated that practitioners should use the treatments that are best supported by evidence, while basing individual treatment plans on experience and clinical practicality. The findings of research studies should be applied to patients with similar characteristics to the study participants.
Research: The authors stated that there is a need for more RCTs, with more rigorous research designs and appropriate outcomes, in lateral epicondylitis.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.