Authors' objectives
To describe the development of the Philadelphia Panel evidence-based clinical practice guidelines (EBCPGs) of rehabilitation interventions for non-specific neck pain, with the purpose of improving appropriate use of rehabilitation interventions for neck pain by clinical practitioners. The authors' realised objective was also to find evidence for the effectiveness of different rehabilitative interventions for neck pain.

Searching
MEDLINE, EMBASE, Current Contents, CINAHL, and the Cochrane Controlled Trials Register were searched up to July 2000. In addition to these, the registries of the Cochrane Rehabilitation and Related Therapies Field and the Cochrane Musculoskeletal Group, and PEDro were also searched. The references of all included trials were examined for relevant studies, and content experts were contacted for additional studies. A structured search was developed, based upon the sensitive search strategy for RCTs recommended by the Cochrane Collaboration and modifications proposed by Haynes et al. (See Other Publications of Related Interest, nos.1-2). Only articles in English, French and Spanish were accepted.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), non-randomised controlled trials, or case-control or cohort studies that evaluated the intervention of interest in a population of more than ten patients were eligible for inclusion in the review.

Specific interventions included in the review
Massage, thermal therapy (hot or cold packs), electrical stimulation, electromyographic (EMG) biofeedback, transcutaneous electrical nerve stimulation (TENS), therapeutic ultrasound, therapeutic exercises (e.g., traction), and combinations of these rehabilitation interventions were eligible for inclusion. Control groups that received active treatment were also eligible for inclusion. Concurrent interventions were allowed if they were given in the same way to both the experimental and control groups, e.g., home exercises, educational booklets, advice on posture.

Participants included in the review
Participants suffering from non-specific neck pain, defined as pain in the neck area, with or without radiation to the extremities, were eligible for inclusion in the review. Both acute and chronic neck pain were included.

Outcomes assessed in the review
Functional status, pain, ability to work, patient global improvement, patient satisfaction and quality of life were assessed in the review.

How were decisions on the relevance of primary studies made?
Two independent reviewers assessed the titles and abstracts of the literature search, using a checklist with the a priori defined selection criteria. Relevant studies were retrieved and the full articles were assessed by two independent reviewers for inclusion.

Assessment of study quality
The validity of the primary studies was assessed using the 5-point validated scale of Jadad et al. (see Other Publications of Related Interest no.3). This assigns 2 points each for randomisation and double-blinding, and 1 point for a description of withdrawals. Two independent reviewers performed the validity assessment and any differences were resolved by consensus.
Data extraction
Two independent reviewers extracted the data for the review, using predetermined extraction forms. Data were extracted into the categories of: population characteristics, details of interventions, trial design, allocation concealment, and outcomes. The data were analysed at three approximate post-therapy time points (1, 6 and 12 months) and for two categories of pain, i.e. acute (less than 4 weeks' duration) and chronic (greater than 12 weeks' duration).

Methods of synthesis
How were the studies combined?
The data were combined where possible using a meta-analysis. Continuous data were analysed using weighted mean differences. Where the same conceptual outcome was measured with different scales (e.g. pain, functional status), the data were analysed with standard mean differences. Dichotomous data were analysed using the relative risk. A random-effects model was used where significant heterogeneity was found, and a fixed-effect model where homogeneity was not significant. Recommendations in the studies were graded according to their level of evidence (I for RCTs; II for non-randomised trials) and by the strength of evidence (A, benefit demonstrated from RCTs; B, benefit demonstrated from non-randomised trials; C, no benefit demonstrated). The clinical improvement, defined as a 15% improvement relative to a control, was calculated. Methods for assessing publication bias were not reported.

How were differences between studies investigated?
Heterogeneity was tested using a chi-squared statistic.

Results of the review
The authors state that 8 studies were eligible for inclusion in the review, although only 5 (4 RCTs and one controlled clinical trial) were included in the text. For acute neck pain, there was one RCT (n=20) of TENS. For chronic neck pain, there were 3 RCTS (n=223) and one controlled clinical trial (n=73) of therapeutic exercises, and one RCT (n=26) of therapeutic ultrasound.

A clinically important benefit was only shown for therapeutic exercises for chronic pain. There was no evidence of a clinically important benefit for three other interventions, and there were insufficient data available for four interventions. No trials were identified for ice, heat or EMG biofeedback.

For acute neck pain (less than 4 weeks), the Philadelphia Panel recommends that there is insufficient evidence to include or exclude mechanical traction for acute non-specific neck pain, and that there is poor evidence to include or exclude TENS alone (grade C for pain) as an intervention for neck pain. No evidence from controlled trials or cohort studies was found for EMG biofeedback, thermotherapy, massage, electrical stimulation, therapeutic exercises, or combined interventions for acute neck pain.

For chronic neck pain (greater than 12 weeks), the Philadelphia Panel recommends that there is good evidence to include supervised exercise programmes alone (including proprioceptive and traditional exercises) for the management of chronic neck pain (grade A for pain and function, grade B for global assessment).

There were insufficient data to make a recommendation regarding mechanical traction alone in chronic neck pain, and poor evidence to include or exclude therapeutic ultrasound alone (grade C for pain) as an intervention for chronic neck pain. EMG biofeedback, massage, thermotherapy, electrical stimulation, TENS and combined rehabilitation interventions could not be assessed owing to lack of controlled studies.

Authors' conclusions
There is scientific evidence to support and recommend the use of proprioceptive and therapeutic exercises for chronic neck pain, but there is a lack of evidence regarding the inclusion or exclusion of thermotherapy, therapeutic massage, EMG biofeedback, mechanical traction, therapeutic ultrasound, TENS, electrical stimulation, and combined rehabilitation interventions in the daily practice of physical rehabilitation of sufferers of acute and chronic neck pain.
CRD commentary
There is some confusion in the presentation of the authors’ objectives, and this is reflected throughout the paper. The authors’ stated aim is to describe the development of the Philadelphia Panel’s recommendations for rehabilitation interventions for neck pain. Initially, this involved a review (and some meta-analysis where possible) of the clinical evidence for a series of different interventions, and then the development of a methodology to translate these findings into a series of recommendations, and finally, validation via a postal questionnaire to practitioners. The paper presents the methodology, the findings and the discussion together for both the review of the clinical evidence, and the development and validation of the methodology for making the recommendations; this makes the paper rather confusing to read. This is ultimately reflected in the conclusions section: in the abstract, the authors draw conclusions upon the appropriateness of the methodology they have employed to develop the recommendations, but in the actual paper, they draw conclusions upon the evidence available (or not) to support different rehabilitation interventions for neck pain.

The findings presented were very detailed and there was ample use of tabulated and figurative data, but these did not always clarify the presentation of the findings in question. The literature search seemed very thorough and the authors clearly stated their methodology for conducting the review, the validation procedure and the data extraction. The authors stated that a total of eight trials meeting all the selection criteria were found by the literature search, but then in the detailed description of the findings, only five seem to have been included; these, together with those that were described but eventually excluded, exceed the original stated eight. There was a discrepancy in the number of included participants in the controlled clinical trial of therapeutic exercises for chronic neck pain: 73 were specified under 'Summary of Trials' versus 47 under 'Efficacy'; the reason for this disparity was not explained. The range of statistical tests employed seemed appropriate and the results were presented graphically. However, there was no numerical presentation of these results in the narrative report of the findings, which would have been helpful.

The authors’ conclusions in relation to the recommendations for rehabilitative interventions for neck pain seem appropriate in the light of the data they present in the text. The mixing of the review of neck pain interventions with the methodology and validation for EBCPGs has made the paper difficult to read; it might have been helpful to have separated them into two different papers.

Implications of the review for practice and research
Practice: The authors state that only proprioceptive and therapeutic exercises have been demonstrated to be as effective as rehabilitation interventions for chronic neck pain.

Research: The authors state that further research in the form of well-designed RCTs is required to assess the use of each rehabilitation intervention for patients with acute and chronic neck pain. Future research in physiotherapy should also adopt rigorous methods.

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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.