The effectiveness of hand exercises for persons with rheumatoid arthritis: a systematic review
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CRD summary
This review investigated the effectiveness of hand exercises in people with rheumatoid arthritis. The author concluded that there was no strong evidence for or against these interventions. Although the potential for bias in the review could not be fully assessed, the main weakness appears to have been in the primary studies. The author's conclusion therefore seems appropriate.

Authors' objectives
To assess the effectiveness of hand exercises for people with rheumatoid arthritis.

Searching
MEDLINE, CINAHL, EMBASE, PEDro and the Cochrane Library were searched from 1980 to December 2003 for English language articles; the search terms were reported. The reference lists of papers identified by this search were checked for further studies.

Study selection
Study designs of evaluations included in the review
Both comparative trials and case series were eligible for inclusion. Studies that described exercise interventions but did not report outcomes were excluded.

Specific interventions included in the review
Studies of any form of hand exercise, including range of motion, strengthening and endurance exercises, motor control and motor learning, were eligible for inclusion. Different types of exercise could be combined, and exercise could also be combined with other forms of therapy. The specific interventions in the review included strengthening exercises, range-of-motion exercises and non-specific exercises, sometimes combined with wax baths, faradic baths, or ultrasound. Comparison interventions included non-exercise therapy, different combinations of exercise and additional therapy, and no treatment.

Participants included in the review
Studies of patients with a diagnosis of rheumatoid arthritis were eligible for inclusion. Studies that only included patients with other forms of arthritis, such as juvenile arthritis, were excluded, as were studies of patients undergoing rehabilitation after hand surgery. All included studies were of patients with classic or definite rheumatoid arthritis, while some, but not all, specified hand involvement. Other details of the participants in the included studies were incomplete.

Outcomes assessed in the review
The studies had to report impairment or functional outcomes specific to the hand, such as strength, range of motion, dexterity, pain, stiffness and self-reported measures of function. Additional outcomes reported in the included studies were joint swelling, deformity and measures of disease activity. Strength measurements included grip and pinch strength. Stiffness was either assessed subjectively, or measured objectively as the resistance to joint movement. Few details were provided of the methods used to measure some outcomes. The outcomes were assessed immediately in some studies, while in others the follow-up period ranged from 3 weeks to 4 years.

How were decisions on the relevance of primary studies made?
The author did not state how the papers were selected for the review, or how many reviewers performed the selection.
Assessment of study quality
The validity of the primary studies was assessed using a checklist of 24 criteria (see Other Publications of Related Interest). These related to the research question, study design, randomisation and blinding, patient recruitment and follow-up, provision of the intervention and comparator, outcome assessment, statistical analysis and conclusions. Each item was scored out of 2, giving a total possible score of 48. The author did not state how the papers were assessed for validity, or how many reviewers performed the validity assessment.

Data extraction
The author did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data on the characteristics of the patients and interventions, and outcome measures appear to have been extracted as reported in the primary studies. For the results, the existence of differences between the groups after treatment or changes from baseline were extracted. However, quantitative data on the sizes of the differences or changes were not extracted.

Methods of synthesis
How were the studies combined?
Details of the studies were tabulated and some of the results were discussed in a brief narrative.

How were differences between studies investigated?
The author discussed some differences between the studies, for example in the use of additional treatment modalities, comparison groups, length of follow-up and study quality.

Results of the review
The review included 9 studies with a total of 452 patients. Information relating to the study design was not given. It can be gleaned from the reference relating to the quality assessment scale, which itself (the reference) was not cited in the review, that this might not have been the scale used.

The quality scores for the included studies ranged from 20 to 39 out of a possible 48.

Few studies used psychometrically sound measures or reported on changes to everyday function, although there were some statistically significant results for some outcomes, their reliability was doubtful. Impairment and dexterity were frequent outcomes, but the measurement of self-reported outcomes was lacking. Long-term exercise may increase strength. There were only inconsistent findings relating to range of motion.

Authors' conclusions
There was no strong evidence about the effectiveness of hand exercises in people with rheumatoid arthritis. The results suggested that appropriate exercises might have long-term effects on strength, and very short-term effects on stiffness.

CRD commentary
The review question was clearly defined in terms of the participants, interventions, outcomes and study designs. Several relevant electronic databases were searched, although no justification was provided for limiting the electronic search to papers published from 1980 onwards. The restriction to English language articles might have resulted in some relevant papers being missed and the introduction of language bias. There was also a possibility of publication bias as no attempt was made to search for unpublished research. The potential effects of these biases were not considered. Study quality was assessed and the results were reported in the review. However, the interpretation of these results required access to a separate publication, which was not cited in the review. The methods for the study selection, validity assessment and data extraction processes were not reported, thus the potential for reviewer errors and bias cannot be assessed.

Some relevant study details were reported, although information on the characteristics of the participants and interventions was limited. The details provided indicated that there was considerable heterogeneity and that a narrative
summary was appropriate. Within the narrative, the discussion of the primary studies was very limited and the synthesis very brief. There was some discussion of clinical and methodological differences between the studies, but only limited consideration of the reasons for differences in the results. The author highlighted some limitations of the primary studies. This was not a well-reported review but the author's conclusion, that there was no strong evidence for or against the effectiveness of hand exercises, seems appropriate.

**Implications of the review for practice and research**

Practice: The author stated that therapists should use their knowledge of rheumatoid arthritis and exercise training to decide upon interventions for the hand. Therapists should also monitor disease activity and deformity, to ensure that exercise does not produce adverse effects.

Research: The author stated that further randomised controlled trials with goal-specific exercise, outcome measures that are appropriate to the goal, adequate sample size and use of an appropriate control treatment, are required.

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**Other publications of related interest**


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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.