The effects of mental practice in stroke rehabilitation: a systematic review
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CRD summary
The authors concluded that no clear conclusions could be drawn about the effects of mental practice and that further research is required. Despite limitations to this review, the authors’ conclusions appear to reflect the limited evidence from a small number of diverse studies.

Authors' objectives
To evaluate the effects of mental practice on the recovery of stroke patients.

Searching
The Cochrane Database of Systematic Reviews, MEDLINE (via PubMed), PsycINFO, Pedro, REHADAT and RehabTrials were searched to August 2005 using the reported keywords. The reference lists of included studies were screened and searches were conducted for other articles by the authors of included studies. Studies were included if they were reported in English, German, French or Dutch.

Study selection
Study designs of evaluations included in the review
The authors stated that their focus was on randomised controlled trials (RCTs) and non-randomised controlled trials, but that other studies that included additional information were also eligible. The included studies ranged from RCTs to single-case reports.

Specific interventions included in the review
Studies that evaluated mental practice interventions aimed at improving physical activity during rehabilitation, and in which 'an internal representation of the movement is activated and the execution of the movement repeatedly mentally simulated, without physical activity, within a chosen context', were eligible for inclusion. The included studies generally evaluated mental practice using tape instruction, self-regulation, and observation followed by practice. Mental practice was used as an additional intervention in some of the included studies. The duration of the interventions ranged from 2 to 6 weeks and sessions were conducted from several times per day to three times per week.

Participants included in the review
Studies of adult stroke patients were eligible for inclusion. Most of the patients in the included studies were recruited through therapy clinics, hospitals and a stroke database. The mean age of the patients generally ranged from 62.3 to 72.7 years and the time from stroke onset ranged from 7 days to 6 years.

Outcomes assessed in the review
Studies that assessed recovery from stroke were eligible for inclusion. Most of the included studies assessed arm function; others assessed the effects of other skills and leg and foot function. Physical function was assessed using a variety of instruments (details were reported).

How were decisions on the relevance of primary studies made?
Three reviewers independently conducted the searches and two reviewers independently screened abstracts. Any disagreements on inclusions were resolved through consensus or through recourse to a third author.

Assessment of study quality
Two reviewers independently assessed the validity of RCTs and controlled clinical trials (CCTs) using the Amsterdam-Maastricht criteria, which evaluate the following: randomisation; allocation concealment; baseline comparability of the treatment groups; blinding of the patient, carer and outcome assessor; control treatment corrected for attention;
acceptable compliance; relevant measures; timing of the assessment; and intention-to-treat analysis. The maximum possible score was 11 points. Studies scoring 6 or more points were classified as being of 'sufficient quality'.

Data extraction
Two reviewers independently extracted the data from RCTs and CCTs using a standardised form. For some outcomes in some studies, the results data were presented in various formats (including treatment effect sizes and changes in scores from baseline for each treatment group).

Methods of synthesis
How were the studies combined?
The studies were grouped by study design and combined in narrative.

How were differences between studies investigated?
Differences between the studies were discussed with respect to study quality, participants and interventions.

Results of the review
Ten studies (n=111) were included in the review: 5 class I studies (4 RCTs, n=76; 1 non-randomised CCT, n=20) and 5 class III studies (2 case series, n=12; 3 single-case reports, n=3).

Class I studies (4 RCTs and 1 CCT).
The sample sizes were small (4 studies had fewer than 20 participants; the fifth study had 46 participants). The quality scores ranged from 2.5 to 7 out of 11. Three studies were considered to be of 'sufficient quality'. The 3 studies of 'sufficient quality' reported positive effects of the intervention on arm function only (2 studies) or arm function plus other skills (1 study). Two studies reported significant improvements at 'impairment' and 'activity' levels. One low-quality study reported improvements at the physical 'impairment' level, whilst the other low-quality study reported no positive effects of mental practice.

Class III studies (2 case series and 3 single-case reports).
All 5 studies reported positive effects of mental practice on physical recovery of arm and leg function.

Authors' conclusions
No clear conclusions could be drawn about the effects of mental practice. Further research is required.

CRD commentary
The review addressed a clear question that was defined in terms of the participants and intervention; inclusion criteria for the outcomes and study design were broad. Several relevant sources were searched and attempts were made to minimise language bias. No specific attempts to minimise publication bias were reported; the authors acknowledged this limitation. Validity was assessed and the results were reported. Methods to minimise reviewer errors and bias in the study selection, validity assessment and data extraction processes were reported. In view of the differences amongst the studies, a narrative synthesis that took account of study quality was appropriate. The results data were not presented consistently for physical outcomes, which meant it was not possible to verify the results reported in the text. Despite limitations to this review, the authors' conclusions appear to reflect the limited evidence from a small number of diverse studies.

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

Research: The authors stated the need for further research that clearly defines the content of mental practice and
assesses outcomes using standardised measures.

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