Evidence for effectiveness of treatment of loudness, rate, or prosody in dysarthria: a systematic review
Yorkston K M, Hakel M, Beukelman D R, Fager S

CRD summary
The review assessed interventions for global aspects of speech in individuals with dysarthria. The authors concluded that there was limited evidence of efficacy, with the exception of modification of loudness in individuals with Parkinson's disease hypokinetic dysarthria, for which there was some evidence of effectiveness. The review methodology and results were poorly reported and the reliability of the conclusion cannot be determined.

Authors' objectives
To assess the evidence for interventions for the treatment of dysarthria which focus on the global aspects of speech.

Searching
PsycINFO (from 1967), MEDLINE (from 1966) and CINAHL (from 1982) were searched to November 2004; the search terms were reported. Relevant books and references were handsearched.

Study selection
Studies that enrolled people with a primary communication diagnosis of dysarthria were eligible for inclusion. Studies in unimpaired individuals, or individuals with other disorders, were excluded from the review. The participants in the included studies had Parkinson's disease (PD), progressive supranuclear palsy, multiple sclerosis, amyotrophic lateral sclerosis, traumatic brain injury, encephalopathy, cerebral palsy, cerebrovascular accident, spastic diplegia, tumour, multiple system atrophy, Shy-Drager syndrome and developmental delay. The type of dysarthria diagnosed included hypokinetic, ataxic and flaccid, with or without spasticity, while severity ranged from mild to profound. The majority of studies enrolled adults of both genders. Eligible studies assessed interventions that focused on the global aspects of speech. Studies of interventions that focused only on single speech subsystems were excluded from the review. The included studies examined a number of interventions for loudness, speaking rate, prosody and general instructions. No inclusion criteria for the outcomes were reported, beyond the requirement for some outcome data. The included studies reported acoustic physiological, perceptual and acoustic outcomes. A wide range of outcomes relating to the specific aspects of speech being addressed were reported. No inclusion criteria were reported for the study design, but the included studies appeared to be case reports and small uncontrolled group studies.

The authors did not state how the papers were selected for the review, although it appears that at least two reviewers performed the selection.

Assessment of study quality
The assessment of the validity of the included studies was unclear, but it appears that two reviewers rated studies on the basis of participant description (18 descriptors) and assessed intervention consequences, including the presence of a comparison group, using published criteria.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
The studies were combined in a brief narrative, grouped by the focus of the intervention assessed, and were also summarised in tables.

Results of the review
Fifty-one studies were included in the review; it appears that all were case studies or small group studies.
Loudness (21 studies, n=308): in general, statistically significant improvements were found in PD patients who completed a 16-session course of Lee Silverman Voice Treatment. This was compared with a respiratory only approach in some studies, with favourable results; 2-year follow-up data were also positive.

Speaking rate (19 studies, n=121): a variety of techniques were used to modify speaking rate with some success. The relationship between rate and intelligibility of speech was not simple, and there was evidence of a relationship with the severity of dysarthria.

Prosody (10 studies, n=32): there were insufficient data to compare the effectiveness of specific versus general approaches to training.

General instructions (6 studies, n=31): specific feedback about speech production adequacy resulted in improved intelligibility. There was no strong evidence of real benefit resulting from general instructions to speak clearly.

There were some discrepancies between the text and tables for study and participant numbers; figures reported here are from the text.

Authors’ conclusions
The authors appear to conclude that there is only limited evidence for the efficacy of most interventions, the exceptions being modification of loudness in individuals with PD and hypokinetic dysarthria and, to a lesser extent, modification of speaking rate for increased intelligibility, where some evidence of effectiveness exists.

CRD commentary
The review question and the inclusion criteria were clear for the intervention and population, but not for the study design or outcomes. The authors searched three relevant databases and other sources, but made no apparent attempts to seek unpublished studies; this may have increased the possibility of publication bias or that some relevant studies were not included in the review. The authors appear to have used methods designed to reduce reviewer bias and error in the assessment of study validity, and possibly the selection of papers for the review, but not in the data extraction. The authors did carry out a validity assessment although it is unclear how this was used to inform the synthesis. Little specific synthesis of the outcomes was provided. The decision to adopt a narrative synthesis appears appropriate in view of the level of clinical and methodological heterogeneity between the studies, but the lack of a focused discussion of the outcomes makes it difficult to assess the evidence and, therefore, it is impossible to assess the reliability of the conclusions.

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

Research: The authors stated that long-term studies are required to determine the optimal frequency, intensity and duration of interventions, and to establish the role of maintenance treatment for different types of dysarthria. They also stated that future research should adhere to either the CONSORT or the TREND guidelines for methodological rigour, while the adequacy of outcome measures should be ensured. In particular, generalisation of effects and their social validity should be investigated through the use of perceptual rating of prosody, assessment of speech intelligibility in adverse conditions, measurement of listener effort, and adequacy of communication in natural settings. Finally, research to determine the suitability of individuals for specific treatment and, in particular, the appropriate treatment of children with dysarthria, is required.

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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.