

# Rehabilitation in Vascular Dementia: Rehabilitation of Speech and Language Manifestations of Cognitive Impairment in Vascular Dementia using a Spaced Repetition Based Approach

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## Abstract

One of the most common clusters of manifestations of cognitive impairment associated to vascular dementia is related to the handling of language. Regarding rehabilitation approaches, spaced repetition based techniques offer advantages in cases on mild and severe cognitive deterioration because they allow the automation in the use of Word families of key importance in daily communication for patients with severe impairment in cognitive processing.

## Introduction:

Cognitive impairment is a defining feature of dementia caused by neurodegenerative conditions such as Alzheimer's disease (AD) and cerebrovascular disease. In the milder stages of dementia, cognitive impairments are often the most disabling and distressing features for the individual and their family. For the person with dementia, memory and other cognitive difficulties can have a major impact on levels of confidence and can lead to anxiety, depression, and withdrawal from activities, which in turn can result in 'excess disability'. Family caregivers are also affected because of the practical impact of cognitive problems on everyday life and the strain and frustration that often result. Interventions to assist with aspects of cognitive functioning such as memory problems and associated functional limitations are therefore important in the milder stages of dementia as they may allow the person greater independence and can potentially minimize the risk of excess disability. Interventions for people with mild dementia can be pharmacological, non-pharmacological, or both. Within the broader context of non-pharmacological interventions for people with mild dementia there has been a steady increase in interest in the class of interventions generally referred to as cognition-focused interventions and these form the focus of the present review.

Although extensive efforts to develop disease modifying treatments continue consistently disappointing results from drug trials with various agents have led to considerable doubt that disease-modifying treatments can show a positive effect by the time dementia is fully developed and efforts in this direction are increasingly being shifted to the pre-dementia or even the pre-symptomatic stage. In contrast, non-pharmacological interventions and particularly cognition-based interventions are increasingly being recognized as an important adjunct and in some cases, alternative to pharmacological treatments for individuals with dementia and those at risk of

dementia. Nevertheless earlier studies suggested that cognition-based interventions are not appropriate, as they are ineffective and result in frustration and depression for participants and caregivers. With a growing emphasis on early detection and intervention in dementia care, the need for a clear evidence base for cognition focused interventions is therefore becoming increasingly apparent.

## Cognition Focused Interventions:

Cognition-focused interventions are interventions that directly or indirectly target cognitive functioning as opposed to interventions that focus primarily on behavioral (for example, wandering), emotional (for example, anxiety), or physical (for example, sedentary lifestyle) function. Several types of cognition-based interventions have been described. The potential benefits of reality orientation and of non-specific stimulation of cognitive functioning for people with dementia have long been recognized. These interventions typically involve engaging the person with dementia in a range of general activities and discussions are commonly conducted in groups and are aimed at general enhancement of cognitive and social functioning. A recent Cochrane Review that focuses on interventions falling under this category concluded that general cognitive stimulation and reality orientation approaches consistently produce improvements in general cognition and, in some cases, in self-reported quality of life and well-being, primarily for people with mild to moderate dementia.

Progress in understanding the operation of memory and related cognitive functions and of the mechanisms underpinning learning has facilitated the development of more specific approaches designed to help maintain or enhance cognitive functioning and well-being for people with AD or vascular dementia (VaD) most commonly those in the milder stages. These more recent approaches to cognition-based interventions are most commonly referred to as cognitive training or retraining or remediation or brain training or cognitive rehabilitation. The present review focuses on these two more recent forms of cognition-based interventions. A more detailed review is published and regularly updated in the Cochrane Database of Systematic Reviews (CDSR). Because the terms cognitive training and cognitive rehabilitation traditionally have been applied somewhat interchangeably in the literature Clare and colleagues have previously offered the following broad definitions and descriptions with the aim of clarifying the

nature of these two related but distinct forms of intervention. Cognitive training typically involves guided practice on a set of standardized tasks designed to reflect particular cognitive functions such as memory, attention, or problem solving. Tasks may be presented in paper-and-pencil or computerized form or may involve analogs of activities of daily living. Tailoring of task difficulty on the basis of the individual performance level and adaptive training that is, adjustment of task difficulty in response to change in performance level is becoming increasingly available through computerized packages for example. One assumption underlying cognitive training is that practice has the potential to improve or at least maintain functioning in the given domain.

An additional assumption is that any effects of practice will generalize beyond the immediate training context. Although this latter assumption has not often been supported by the evidence some have argued that the failure to produce transferable benefits is related in part to problems with task design. Recently, some have broadened the definition of cognitive training to include strategy training, which involves the instruction and practice of strategies to minimize cognitive impairment and enhance performance for example, method of loci and visual imagery and cognitive exercise. Cognitive training may be offered through individual or group sessions or facilitated by family members with therapist support. In accordance with the suggestion that cognitive training may enhance the effects of pharmacological therapy some studies have evaluated the efficacy of cognitive training in combination with acetylcholinesterase-inhibiting or other medications. In addition cognitive training for persons with dementia has sometimes been included as a component of supportive interventions for caregivers. Both cognitive training and rehabilitation might be accompanied by psych educational activities aimed at facilitating an understanding of cognitive strengths and difficulties and by supportive discussion relating to individual emotional reactions or other needs, and where appropriate, links would be made with other possible sources of support.

**Objective:**

To analyze the effectiveness of spaced repetition based rehabilitation of speech language in vascular dementia.

**Method:**

2 patients diagnosed of mild vascular dementia and 1 patient diagnosed of severe vascular dementia were submitted to rehabilitation using spaced repetition exercises with vocabulary organized into Word families related to basic actions and events from their daily life. Each patient was stimulated with three groups of twenty words each and supported by graphic material. Measures in the naming of words when confronted

with the item were made pre-rehabilitation and post-rehabilitation monthly over a period of 8 months.

**Results:**

All patients improved in denomination of chosen items and kept that improvement during periodical assessments over the 8 month periodical though a slight declination in performance was observed from the 6th month. Case 1 named 8, 5 and 7 words at baseline. After rehabilitation, performance improved to 16, 12 and 15 and declined to 13, 11 and 12 after the 8 month period. Baseline in Case 2 was 6, 8 and 9 words and improved to 15, 18 and 13 after rehabilitation with a decline to 13, 15 and 10 after the 8 month period. Case 3 performed 2, 4 and 7 at baseline and improved to 10, 13 and 11 after rehabilitation with a decline to 10, 11 and 9 after the 8 month period.

**Conclusion:**

Spaced repetition based exercises is a useful asset when dealing with vocabulary re-acquisition in patients affected by vascular dementia and offers a reasonable prognosis over time despite neurodegenerative factors.

**Discussion:**

The aim of this updated review was to evaluate the current evidence regarding the efficacy of cognitive training and cognitive rehabilitation interventions for people with mild AD or VaD. Eleven studies of cognitive training were identified for inclusion in the review (and nine of these were included in the previous version of this review), and meta-analysis was performed on several primary and secondary outcomes in the short and medium term. No positive or adverse effects of cognitive training were detected in the meta-analysis. The finding of no adverse effects of cognitive training is relevant in light of proposals from previous commentators that cognitive training may have a negative impact, particularly on mood. Only one RCT of individualized cognitive rehabilitation was identified. Hence, no meta-analysis could be conducted.