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FREE AND CUED SELECTIVE REMINDING DISTINGUISHES ALZHEIMER'S DISEASE FROM VASCULAR DEMENTIA

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To the Editor: Although clinicians have long been interested in the possible role of cognitive profiles in distinguishing patients with Alzheimer's disease (AD) from those who have vascular dementia (VaD), this distinction is not straightforward. Because impairment in executive functioning can limit learning in elderly people,¹ decrements in performance on conventional memory tests may result from primary memory deficits or apparent memory deficits due in part to executive and attentional deficits. Thus, the memory profiles of AD and VaD may appear similar when memory is assessed with tests that depend upon frontal and attentional processes. Distinguishing the profiles may require assessing memory with tests that control attention and cognitive processing. It was hypothesized that patients with VaD would benefit more from controlled learning procedures than patients with AD, whose hallmark deficit is memory impairment.

The Free and Cued Selective Reminding Test (FCSRT) controls the learning conditions by having subjects search a card containing four pictures of items (e.g., grapes, toaster) that go with unique category cues (e.g., fruit, kitchen appliances). After all four items are identified, immediate cued recall of just those four items is tested. After controlled learning has been completed for all 16 items, there are three test trials consisting of free recall, followed by cued recall for those items not retrieved using free recall. The sum of free and cued recall on each trial is called total recall. The FCSRT procedure is described in detail elsewhere.²

These controlled learning procedures were designed to minimize inattention, promote deep semantic processing, and control conditions during encoding that are reinstated at retrieval for maximum recall.

The study took place in an urban academic primary care practice following procedures approved by the local institutional review board. Each study participant underwent a

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neuropsychological evaluation consisting of a screening battery and an independent diagnostic battery used to determine cognitive status.³ Informants completed the structured Clinical Dementia Rating Scale (CDR) interview.⁴ Dementia diagnosis and CDR score were established according to consensus of a neuropsychologist (EG), a geriatrician, and a geriatric psychiatrist using *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria for dementia⁵ without knowledge of FCSR results. The study neurologist (AES) subsequently assigned dementia subtypes using established criteria for probable or possible AD⁶ and probable or possible VaD.⁷

Participants were 344 African-American and Caucasian patients aged 65 and older who scored 18 or higher on the Mini-Mental State Examination (MMSE). Of the 60 participants (17%) who met DSM-IV criteria for dementia, most with very mild dementia (CDR 0.5), 27 (45%) had possible or probable AD, and 14 (23%) had possible or probable VaD. The eight (13%) participants who had mixed dementia (AD+VaD) were grouped with the patients with AD. Twelve patients with other dementias were excluded from this analysis. Two hundred eighty-three patients did not meet criteria for dementia.

Established cutscores were used to determine the sensitivity and specificity of free recall⁸ and total recall² for patients with AD versus VaD (Table 1). Eighty-three percent of patients with AD and 79% of patients with VaD displayed impaired free recall. Specificity of free recall was 76% (216/283). Impaired free recall in patients without dementia was associated with CDR rating; 82% of patients with impaired free recall and 41% of patients with intact free recall had a CDR of 0.5. As predicted, sensitivity of total recall varied as a function of dementia subtype. Seventy-one percent (25/35) patients with AD had impaired total recall, whereas 79% (11/14) patients with VaD patients had intact total recall. This differentiation was not due to differences in severity of dementia between patient groups as measured by the sum of CDR box scores.⁴ A logistic regression model was fit to the data with impairment on total recall as the outcome. Dementia subtype was a significant predictor; patients with AD were 9.17 times as likely to have impaired total recall as patients with VaD; they were 7.74 as likely after controlling for dementia severity. Specificity of total recall was excellent; only 6% of patients without dementia had impaired total recall.

The results confirmed the predictions; impaired free recall was common in patients with AD and VaD, but impaired total recall occurred only in patients with AD, underscoring the centrality of memory deficits to this disorder. In contrast, patients with VaD displayed intact total recall, showing the expected benefit of controlled learning, perhaps because, in patients with VaD, the frontal and attentional system plays a more profound and important role. These results demonstrate the promise of FCSR for distinguishing between AD and non-AD dementias, further enhancing its sensitivity and specificity as a case-finding tool for identifying preclinical and early dementia.^{3,9,10}

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Table 1

Sensitivity and Specificity of Free Recall and Total Recall for Patients with Alzheimer's Disease (AD) and Vascular Dementia (VaD)

Recall	No Dementia	AD	VaD
Free recall score			
> 24, n	216	6	3
≤ 24, n	67	29	11
Specificity	0.76		
Sensitivity		0.83	0.79
Total recall score			
> 44, n	267	10	11
≤ 44, n	16	25	3
Specificity	0.94		
Sensitivity		0.71	0.21