

TIPS Case Study

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How the TIPS can be used to highlight impairments in Alzheimer's disease.

Appendix E: Case Studies 197

**Case Study A:
Probable Dementia of the Alzheimer's Type, Mild
(Age: 62 years)**

Reason for Referral

Ms. Jones is a 62-year-old African-American female with a history of diabetes and arthritis. The primary reason for referral for further neurological examination was to evaluate her short-term memory processing.

She was accompanied to the examination by her daughter, who was the primary reporter regarding her status. Ms. Jones has been showing a gradual and progressive difficulty with short-term memory dating back about six months prior to the examination. She was described as being independent and self-reliant up until this time. She has had to rely more on her daughter to cook, take her shopping, and bathe her. Ms. Jones forgets to eat and bathe.

She had a complete general medical physical examination to include thyroid function studies, vitamin B-12 levels, CBC, hemoglobin A-1C, sedimentation rate, blood urea nitrogen and creatinine levels, rapid plasma reagin, liver function tests, and folate levels. There were no problems identified in any of these areas. Blood pressure was slightly elevated at 148/78, and resting pulse was 78.

She does not use tobacco products, alcohol, or illegal drugs. During the neurological examination she presented as being well nourished and in no acute distress. Her lungs were clear and no bruits were identified. A mild systolic murmur was identified. She was warm and well perfused in all extremities. She was oriented to place, but had some difficulty identifying the month. She was able to give the correct day of the week, though. There was no evidence of hallucinations or delusional thinking.

She did not exhibit any resting or movement tremors, showed good finger-to-nose movements bilaterally and good fine finger movements. Her sensory examination reflected generally intact systems. She walked with a slightly hunched posture and used a cane as an aid. No apparent problems with balance were identified.

Findings from a CT scan of the head identified small-vessel white matter abnormalities and six small lacunar infarctions in the periventricular deep white matter. Generalized atrophy that was slightly greater than age-level expectancies was also noted.

Neuropsychological Testing Results

Issues and Concerns Obtained from the Clinical Interview

- She has active conversations out loud with herself where she discusses her fears of hell and believes she will be punished.
- **198 Test of Information Processing Skills**
- She wanders around the house at night and sometimes shouts out loud.
- She has shown personality changes in which she has become irritable, angry, and “mean” for no reason.
- Her memory is impaired on an inconsistent basis throughout the day, where she is sometimes able to recall information and experiences, but then forgets other information within a few minutes following a discussion or having done something.
- She is reluctant to eat because her food tastes bitter and she believes she will begin vomiting.
- She forgets to bathe.
- Sometimes she can converse in a normal way and then loses the ability to engage in a conversation that makes sense.

Repeatable Battery for the Assessment of Neuropsychological Status

	<u>Standard Score</u>
Immediate Memory	65
Visuospatial/Constructional	50
Language	54
Attention	56
Delayed Memory	48
Total Battery Score	49 (< 0.1 %ile)

Clock Drawing Test: Overall Rating = 5, Severe visuospatial disorganization

Wechsler Abbreviated Scale of Intelligence

	<u>T-scores</u>		<u>Standard Score</u>	<u>Percentile</u>
Vocabulary	44	Verbal IQ	86	18
Similarities	47	Performance IQ	83	1
Block Design	36	Full Scale IQ	83	13
Matrix Reasoning	41			

Trailmaking A Test: Time to completion: 43 seconds **Scaled score:** 7

Trailmaking B Test: Time to completion: > 300 seconds **Scaled score:** 1

Wide Range Achievement Test-3

	<u>Standard Score</u>	<u>Percentile</u>
Reading	89	7
Arithmetic	84	4
Spelling	60	1

	<u>Scaled Score</u>
Verbal Fluency Test (FAS):	6
Semantic Fluency Test (animals):	5
Speech-Sounds Perception Test:	7
Seashore Rhythm Test:	4
Finger Tapping Test (dominant hand):	9
Finger Tapping Test (nondominant hand):	9

Mini Mental Status Examination: 17/30 items correct (moderate dementia)

Test of Information Processing Skills

The *TIPS* was used to examine her information processing efficiency. The *TIPS* measures a person's ability to acquire and retain information presented through the visual and auditory modalities in the absence of verbal interference and in the presence of varying degrees of verbal interference. The test also measures the facility with which a person initially acquires, stores, transfers, accesses, and retrieves linguistic information within the shortterm/working memory and long-term memory systems. It also measures sustained attention and concentration.

***TIPS* subtest raw scores / scaled scores** were:

	VISUAL		AUDITORY	
	<u>Ordered</u>	<u>Unordered</u>	<u>Ordered</u>	<u>Unordered</u>
Short-term Memory	4 / 3	9 / 5	7 / 4	9 / 4
Working Memory 1	1 / 1	5 / 5	4 / 6	5 / 5
Working Memory 2	1 / 2	2 / 1	2 / 4	6 / 6

These **Process and Modality standard scores** were achieved:

Visual Ordered	60	Auditory Ordered	73
Visual Unordered	68	Auditory Unordered	75
Visual Modality	63	Auditory Modality	73

The **Memory Index** reflects the lengths of the longest strings recalled in either the correct serial order or without regard to serial order and is based on the raw scores. These scores were:

	VISUAL		AUDITORY	
	<u>Ordered</u>	<u>Unordered</u>	<u>Ordered</u>	<u>Unordered</u>
Short term Memory	3	3	3	3
Working Memory 1	0	1	1	1
Working Memory 2	0	1	0	1

Delayed Recall	Raw Score	Scaled Score	Standard Score
	0	5	75

Error Scores	<u>Visual</u>	<u>Auditory</u>	<u>Total</u>	<u>Interpretation</u>
AI Errors	0	0	0	No impairment
PI Errors	12	9	21	No impairment

Word Fluency	<u>Raw Score</u>	<u>Scaled Score</u>	<u>Standard Score</u>
Oral Production:	2	1	--
Written Production:	0	1	--
WF Score:	--	--	55

Interpretation of Findings

Alzheimer's disease is characterized by a number of cognitive impairments involving information acquisition, storage, and retrieval. Primary features of this disease are an inability to learn new information easily, to include episodic memories deficits. Accelerated rates of forgetting and rapid information loss exist following initial recall of material. It is not unusual for a person with AD to show deficits in their ability to generate language concepts and retrieve specific words from their long-term memory.

Sometimes, they also have difficulty distinguishing among sets of items with similar features, a characteristic that causes deficits in ability to recognize previously learned information. During the early stages of the disease the acquisition of new reformation is most often impaired, but as the disease progresses difficulty with later acquired memories typically emerges.

The performance of Mr. Jones on the Test of Information Processing Skills highlights many of these characteristic symptoms. His scores on both the visual and auditory modality factors fall in the moderately and mildly impaired ranges, respectively. He is manifesting a global inability to acquire and store new information easily, especially when compared with expectations based on measured intelligence.

Scaled scores on the Short-term memory ordered subtests for each modality fall well below the average range and highlight these difficulties with acquisition and consolidation.

Memory index scores show that he is capable of recalling three bits of reformation in the correct order on an immediate basis for visual inputs. But he essentially loses 100% of this information in the presence of minimal verbal interference.

Performance on the auditory memory index scores is modestly enhanced, but reflects the real life limitations of the short-term memory span capacity and the continued rapid information loss following somewhat minimal verbal interference as noted on the raw score for WM2 ordered recall.

His performance on the word fluency subtest also falls in the significantly impaired range, as does delayed memory following around a 10-minute time interval of intervening verbal interference.

The results from the TIPS highlight the significant impairments in recent memory as well as the deficits with word finding, word retrieval, and ability to access and retrieve information from the long-term memory.

Although the number of proactive interference errors does not achieve statistical significance he shows 21 errors. This score has clinical significance in that it shows the difficulties Mr. Jones has in distinguishing among similar sets of information. The ability to make these kinds of distinctions is considered to be a function of the frontal lobes specifically. Compromised functioning in this brain region is highlighted.

I have had continued professional contact with Mr. Jones since this case study was first presented. His continued performance on the TIPS has declined significantly and it is agreed upon by all providers involved with his medical care that he is well into a moderately advanced stage of a probable dementia of the Alzheimer's type. His scores on both the memory modality factors and delayed recall have declined to the lowest available T-score (55).

His response to both Aricpet and Namenda has been modest at best, and not long lived. He is presently receiving home health care services and the family continues to consider a more secure placement for him as his daily functional levels decline.