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## ADVANCED COGNITIVE ASSESSMENT REPORT

**Patient's name:** John Doe  
**NeuroTrax ID #:** 999999999  
**Date of Birth:** August 1, 1927  
**Age:** 81  
**Date of Study:** 07/27/07  
**Date of Report:** 07/28/07  
**Primary physician:** Dr. Marcus Welby

**Pertinent medical and neurological diagnoses:** Coronary artery disease, s/p CVA (left posterior limb internal capsule – full recovery)

**Active Problem or Chief Complaint:** Memory loss.

**Reason for Study:** Evaluation of cognitive function to evaluate a possible diagnosis of mild cognitive impairment (MCI) or dementia.

The patient was referred by the primary physician for an advanced cognitive assessment to evaluate the symptoms and problems noted above. Routine clinical neurological examination was not definitively diagnostic. A targeted neuro-cognitive testing battery was selected.

The patient completed the following Mindstreams® (NeuroTrax Corp., NJ) assessment battery: **Global Assessment Battery**.

The testing language was English, the patient's primary language. The patient demonstrated good effort and understood the testing instructions.

The entire set of Mindstreams testing results was reviewed, analyzed, interpreted, and summarized, as follows. Scores are normalized against a reference sample of comparable age and educational level and given on a standard scale where the mean is 100 and one standard deviation is 15 units. For the purpose of this report, scores at or below 1.5 SD from the mean are considered Abnormal, and scores between 1-1.5 SD are considered Borderline Abnormal:

<b>Mindstreams Index Score</b>	<b>Testing Results</b>	<b>Interpretation</b>
Memory	73.2	Abnormal
Executive Function	88.7	Normal (Below average)
Visual Spatial	96.2	Normal (Below average)
Verbal Function	90.3	Normal (Below average)
Attention	92.9	Normal (Below average)
Information Processing	80.3	Borderline abnormal
Motor Skills	107.4	Normal (Above average)
<i>Global Cognitive Score (avg)</i>	<i>89.8</i>	<i>Normal (Below average)</i>

**SUMMARY OF MINDSTREAMS TESTING RESULTS:** Cognitive testing revealed abnormal memory performance and borderline abnormal information processing speed relative to a reference sample of comparable age and educational level. The other cognitive domains were impaired to a lesser extent.

**CLINICAL IMPRESSION:** The cognitive assessment results provide objective evidence in support of the clinical suspicion of a degenerative cognitive disorder. This is consistent with the chief complaint, and establishes that the patient has MCI or possibly early dementia. The differential diagnosis of MCI vs. dementia relies upon a history of decline in activities of daily living. No decline in activities of daily living in this setting supports a diagnosis of MCI. Continued clinical follow-up should provide greater clarity to the diagnosis.

**RECOMMENDATIONS:**

1. Consider pharmacological treatment, as appropriate according to FDA guidelines.
  - a. *Include any specific recommendations. (eg. FDA approved drugs for Alzheimer's disease, such as Aricept (Pfizer), Exelon (Novartis), Razadyne (Janssen), or Namenda (Forest).*
2. Laboratory tests for:
  - a. *Possible reversible causes of dementia (eg. thyroid function, B12, folate),*
  - b. *Include other tests recommended for this patient, as appropriate (eg. lipid profile, liver function)*
  - c. *Include any neuroimaging recommended for this patient, as appropriate (eg. CT, MRI, PET scan)*
3. Consider behavioral modification and adaptive strategies, including diet management and a daily regimen of physical and mental exercise.
  - a. *Include recommendations for physical exercise (eg. Exercise 150 minutes per week)*
  - b. *Include recommendations for mental exercise (eg. Crossword puzzles, card games, computerized brain fitness programs)*
4. Continue clinical follow-up, including repeat cognitive assessment in 6-12 months, as clinically indicated.

Interpreted by (signature): \_\_\_\_\_

**Patient Name:** John Doe, ID 999999999

**Recent Dates of Testing**

**Date Of Birth:** August 1, 1927

1. July 27, 2007, 11:57 AM

**Referring Physician:** Dr. Marcus Welby

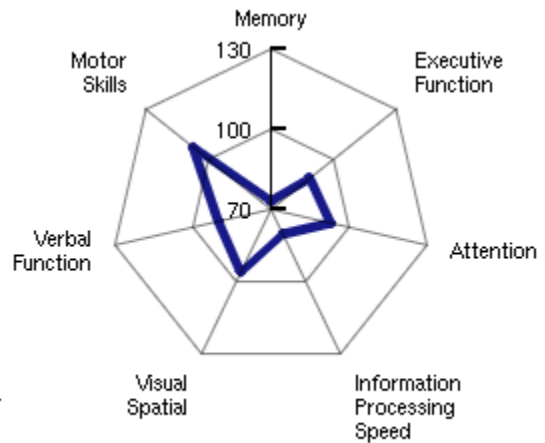
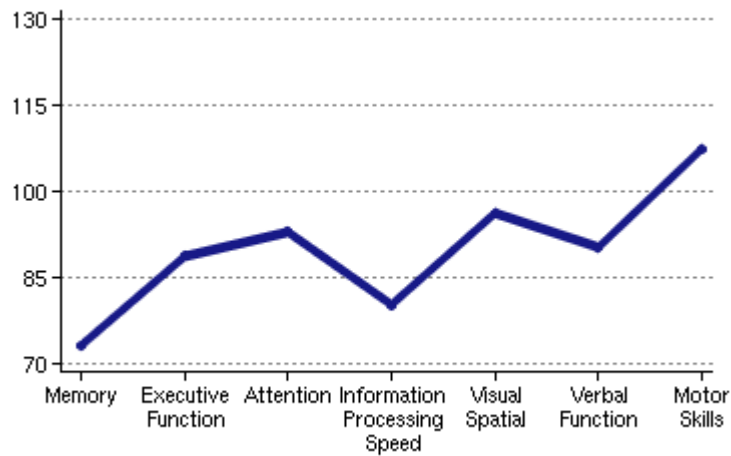
**Reason for Referral:** Routine Cognitive Health Check-Up

**Testing Battery:** Global Assessment Battery

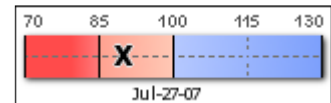
**Tests Included:** Go-NoGo, Verbal Memory, Problem Solving, Stroop Interference, Non-Verbal Memory, Finger Tapping, Catch Game, Staged Info Proc, Visual Spatial Processing, Verbal Function

### Cognitive Profile

Jul-27-07



**Global Cognitive Score: 89.8**



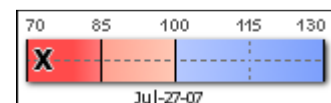
### Summary

Relative to a population matched for age and education, performance on the present testing session was indicative of:

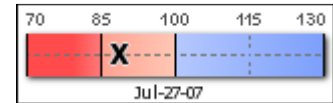
- Cognitive performance below 1 standard deviation from the average in the following cognitive domain(s): *Memory, Information Processing Speed.*
- Below average cognitive performance in the following cognitive domain(s): *Executive Function, Attention, Visual Spatial, Verbal Function.*
- Above average cognitive performance in the following cognitive domain(s): *Motor Skills.*
- **Global Cognitive Function** - Below average cognitive performance.

See "Interpretation of Performance Graphs" below.

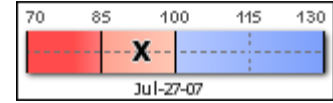
**Memory: 73.2**



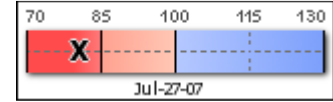
**Executive Function: 88.7**



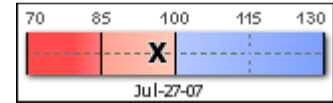
**Attention: 92.9**



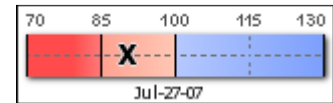
**Information Processing Speed: 80.3**



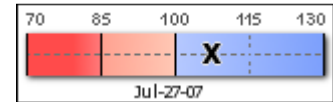
**Visual Spatial: 96.2**



**Verbal Function: 90.3**



**Motor Skills: 107.4**



## Index Score Legend

Jul-27-07  
11:57 AM

<b>Global Cognitive Score</b>	<b>89.8</b>
<b>Memory</b>	<b>73.2</b>
Verbal Memory: Total Accuracy	69.2
Delayed Verbal Memory: Accuracy	70.2
Non-Verbal Memory: Total Accuracy	80.2
Delayed Non-Verbal Memory: Accuracy	DI
<b>Executive Function</b>	<b>88.7</b>
Go-NoGo: Composite Score	65.9
Stroop Interference: Composite Score, Level 3	89.6
Catch Game: Total Score	110.5
<b>Attention</b>	<b>92.9</b>
Go-NoGo: Rsp Time	90.1
Go-NoGo: Rsp Time Std Dev	81.5
Stroop Interference: Rsp Time, Level 2	97.2
Staged Info Proc: Rsp Time, Level 1.2	87.0
Staged Info Proc: Accuracy, Level 2.3	108.8
<b>Information Processing Speed</b>	<b>80.3</b>
Staged Info Proc: Composite Score, Level 1.1	60.1
Staged Info Proc: Composite Score, Level 1.3	87.6
Staged Info Proc: Composite Score, Level 2.1	79.9
Staged Info Proc: Composite Score, Level 2.2	82.0
<b>Visual Spatial</b>	<b>96.2</b>
Visual Spatial Processing: Accuracy	96.2
<b>Verbal Function</b>	<b>90.3</b>
Verbal Function: Rhyming, Accuracy	90.3

<b>Motor Skills</b>	<b>107.4</b>
Finger Tapping: Inter-Tap Interval	100.5
Finger Tapping: Tap Interval Std Dev	104.6
Catch Game: Time to Make 1st Move	117.1

DI - Data Insufficient for a Score

'Composite Score' is computed from Accuracy and Response Time.  
Rsp Time and Rsp Time Std Dev computed for correct responses.

## Detailed Test Results

	Jul-27-07 11:57 AM	
	NORM	RAW
<b>COMPUTER ORIENTATION</b>		
Mouse: Accuracy		100%
Keyboard: Accuracy		75%
Word Reading: Accuracy		75%
Picture Identification: Accuracy		75%
Color Discrimination: Accuracy		100%
<b>GO-NOGO RESPONSE INHIBITION</b>		
	N	R
Accuracy	56.3	57%
Response Time	90.1	620ms
Response Time Standard Deviation	81.5	260ms
Errors of Commission (max. 12)	99.9	5
Errors of Omission (max. 18)	85.8	8
Response Time for Errors of Commission	91.4	700ms
<b>VERBAL MEMORY</b>		
	N	R
<b>Immediate Recognition</b>		
Accuracy, Repetition 1	89.5	30%
Accuracy, Repetition 2	66.5	10%
Accuracy, Repetition 3	68.0	10%
Accuracy, Repetition 4	66.6	10%
<b>Delayed Recognition</b>		
Accuracy	70.2	10%
<b>NON-VERBAL MEMORY</b>		
	N	R
<b>Immediate Recognition</b>		
Accuracy, Repetition 1	105.6	50%
Accuracy, Repetition 2	76.7	13%
Accuracy, Repetition 3	77.6	13%
Accuracy, Repetition 4	77.7	13%
<b>Delayed Recognition</b>		
Accuracy	DI	DI
<b>PROBLEM SOLVING</b>		
	N	R
Accuracy (Non-Verbal IQ)	70.2	0%
<b>STROOP INTERFERENCE</b>		
	N	R
<b>No Interference: Letter Color [1]</b>		
Accuracy	87.5	70%
Response Time	73.8	1925ms
Response Time Standard Deviation	74.7	1076ms

**No Interference: Word Meaning [2]**

Accuracy	108.5	100%
Response Time	97.2	825ms
Response Time Standard Deviation	105.8	185ms

**Interference: Color vs. Meaning [3]**

Accuracy	93.2	47%
Response Time	98.8	1167ms
Response Time Standard Deviation	101.1	477ms

**FINGER TAPPING**

	N	R
Inter-Tap Interval	100.5	250ms
Tap Interval Standard Deviation	104.6	29ms

**CATCH GAME**

	N	R
Time to Make 1st Move	117.1	660ms
Time to Make 1st Move Standard Deviation	119.8	125ms
Average Direction Changes Per Trial	101.7	0.40
Total Score (max. 1000)	110.5	549

**STAGED INFORMATION PROCESSING SPEED**

	N	R
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**SINGLE DIGIT****Slow Speed [1.1]**

Accuracy	53.0	60%
Response Time	65.3	1148ms
Response Time Standard Deviation	85.1	322ms

**Medium Speed [1.2]**

Accuracy	107.3	100%
Response Time	87.0	770ms
Response Time Standard Deviation	114.1	86ms

**Fast Speed [1.3]**

Accuracy	100.0	90%
Response Time	88.3	735ms
Response Time Standard Deviation	90.6	203ms

**TWO-DIGIT ARITHMETIC****Slow Speed [2.1]**

Accuracy	85.5	80%
Response Time	85.1	1659ms
Response Time Standard Deviation	86.3	506ms

**Medium Speed [2.2]**

Accuracy	95.9	90%
Response Time	78.9	1381ms
Response Time Standard Deviation	95.2	285ms

**Fast Speed [2.3]**

Accuracy	108.8	70%
Response Time	97.6	974ms
Response Time Standard Deviation	110.2	143ms

**THREE-DIGIT ARITHMETIC****Slow Speed [3.1]**

Accuracy	80.0	50%
Response Time	80.6	2077ms
Response Time Standard Deviation	112.2	343ms

**Medium Speed [3.2]**

Accuracy	79.0	PP
Response Time	79.1	PP
Response Time Standard Deviation	73.0	PP

**Fast Speed [3.3]**

Accuracy	88.4	PP
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Response Time	89.7	PP
Response Time Standard Deviation	86.3	PP

<b>VERBAL FUNCTION</b>	<b>N</b>	<b>R</b>
Rhyming, Accuracy	90.3	53%
Matching, Accuracy	110.7	97%

<b>VISUAL SPATIAL PROCESSING</b>	<b>N</b>	<b>R</b>
Accuracy	96.2	38%

DI - Data Insufficient for a Score

FP - Failed Practice

PP - Poor Performance

Rsp Time and Rsp Time Std Dev computed for correct responses.

## Interpretation of Performance Graphs

### GENERAL

- Range of 1 standard deviation (SD) above and below the average score for a normative population of similar age and educational level is indicated on the graphs.
- Normative database ranges from ages 12-95 and contains 1,569 individuals as of March 2007.
- Scores are normalized to a standard scale (mean=100, SD=15).
- Scores outside the 70-130 range are plotted on the graphs as circles.
- Timeline charts are shown if the patient has had two or more testing sessions.
- Invalid scores do not appear on the timeline charts.
- Dates of invalid scores appear in parentheses.

### GUIDE TO INTERPRETATION

- Sometimes, patients may score poorly on a given day due to factors that do not represent their general cognitive abilities (e.g. medications that make the patient drowsy, insufficient sleep, or an acute medical illness). If there is suspicion of such, the Mindstreams® testing should be repeated on a day when the patient is at his usual level of function.
- Observation of the change in test scores over time is often helpful in supporting or refuting diagnoses for suspected neurodegenerative disease.

### CAVEATS

THIS REPORT CONTAINS DATA THAT MUST BE INTEGRATED BY THE REFERRING PHYSICIAN WITH THE OTHER CLINICAL DATA AVAILABLE FOR THIS PATIENT. CORRELATION WITH OTHER CLINICAL DATA IS REQUIRED TO DETERMINE THE CLINICAL DIAGNOSIS. APPLICATION OF THE DATA HEREIN, ULTIMATE DIAGNOSTIC DETERMINATIONS, AS WELL AS TREATMENT DECISIONS BASED ON THIS DATA ARE THE SOLE RESPONSIBILITY OF THE REFERRING PHYSICIAN.

PEOPLE DIFFER IN BASELINE COGNITIVE ABILITIES. THEREFORE, REPEATED TESTING IS IMPORTANT WHEN EVALUATING FOR COGNITIVE DECLINE.

### GENERAL CAUTION IN INTERPRETING COGNITIVE DATA

Assessment scores for a given testing session may be below the normal range for a variety of reasons. Before concluding that the results signify pathology:

- Check for acute or chronic medications that may cause cognitive slowing;
- Check for co-morbid medical conditions that may be associated with cognitive dysfunction;
- Understand the baseline functional capacity of the patient. If the patient is of below-average intelligence, he is likely to perform below the normative range of the population even in the absence of new cognitive pathology.

## **DISCLAIMER**

The information provided by NeuroTrax® on the basis of testing with Mindstreams® is of a general nature and is not medical advice, a diagnosis or treatment. The Mindstreams® assessment report does not constitute the practice of medicine or the provision of professional health care advice. The report provides your medical professional with information on how your performance relates to other people your age. NeuroTrax® is not responsible for any decisions made based on information in the report. Your medical professional has the sole responsibility for establishing diagnosis and suggesting appropriate treatment.

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# Mindstreams Clinical Summary

Patient Name: **John Doe, ID 999999999**

Date of Testing: **Jul-27-07, 11:57 AM**

## TEST SUPERVISION

### Supervisor Questionnaire

		1	2	3	4	5
■ How difficult were the tests for the subject?	easy			✓		hard
■ Did the subject find the tests easy to use?	easy			✓		hard
■ Did the subject find the tests easy to understand?	easy			✓		hard
■ How well do you think the subject performed?	best			✓		poorest

### Patient Cooperation

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### Comments

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Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## CLINICAL INTERPRETATION

### Impression

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### Management Plan

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Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_