

# Performance Validity In Deep Brain Stimulation Candidates



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## INTRODUCTION

- Insufficient effort has been shown to affect neuropsychological test performance.
- Previous studies have highlighted the impact of intrinsic motivation to do well on performance validity tests (PVTs) in different populations (Flaro, Green, & Robertson 2007; Chafetz, Prentkowski, & Rao, 2011).
- Diseases associated with aging or other neurological illness can negatively influence PVTs.
- Previous research has found high false positive rates in a heterogeneous dementia sample (Dean et al., 2009).
- To date, no one has looked at PVTs in a sample of highly motivated individuals who are at risk for developing dementia.
- This study will investigate effort in Parkinson's disease (PD) and essential tremor (ET) in DBS surgery candidates who are at increased risk for cognitive impairment.

## METHOD & MEASURES

- 30 DBS candidates from the neurology departments of the Michael E. DeBakey VA Medical Center and Baylor College of Medicine.
- Assessment included the following measures: MMSE, Rey Auditory Verbal Learning Test (RAVLT), Trail Making Test A (TMT-A), Symbol Digit Modality Test (SDMT), Boston Naming Test (BNT), Trial Making Test B (TMT-B), Verbal Fluency (FAS & Animals), and the Word Memory (WMT).
- The WMT "genuine memory impairment profile" (GMIP) was calculated for any failing scores.
- Motor scores were obtained from either The Unified Parkinson's Disease Rating Scale (UPDRS) or The Essential Tremor Rating Assessment Scale (TETRAS).

## PARTICPANT CHARACTERISTICS

Table 1. Demographic Information		
Variables	n	M(SD)
Gender		
Male	28	

Table 2. Cognitive Diagnoses		
Variables	n	
No Diagnoses	15	
MCI		

Female	2	Amnestic	3
Age (years)	66(8)	Non-Amnestic	10
Education (years)	13(2)	Dementia	2

## RESULTS

- 90% of participants passed the WMT (Table 3).
- 8 participants were in the caution range & 3 participants failed the WMT.
- Two of three failing scores met GMIP criteria (1 participant with MCI and 1 participant with no diagnosis).
- Depression scores were highest in the "caution" group (Figure 1). Summary of neuropsychological test performance by group can be found in Table 4.
- Hoehn & Yahr Scores (Median =2, range= 0-5); TETRAS Performance Scores (Mean=31, SD=2)

Table 3. WMT Performance						
Disorder	IR	DR	CN	MC	PA	FR
ET	100	92.5	92.5	60	65	45
ET	100	97.5	97.5	90	90	17.5
ET	100	82.5	82.5	80	65	25
ET	100	87.5	87.5	75	65	32.5
ET	97.5	92.5	95	70	80	35
ET	95	90	90	70	70	35
ET	92.5	95	87.5	55	50	35
ET	92.5	90	87.5	55	60	35
ET	87.5	95	82.5	35	40	17.5
<b>ET</b>						
Average	<b>96.1</b>	<b>91.4</b>	<b>89.2</b>	<b>65.6</b>	<b>65.0</b>	<b>30.8</b>
PD	100	97.5	97.5	75	65	37.5
PD	100	95	95	90	85	35
PD	100	97.5	97.5	100	75	35
PD	100	100	100	100	100	55
PD	100	97.5	97.5	100	95	67.5
PD	97.5	95	97.5	75	65	32.5
PD	97.5	100	97.5	95	85	55
PD	97.5	92.5	90	100	95	45
PD	97.5	82.5	85	80	80	45
PD	97.5	90	87.5	60	70	37.5
PD	95	95	95	45	40	37.5
PD	95	95	95	85	75	37.5
PD	95	100	95	100	90	77.5
PD	95	100	95	100	95	47.5
PD	95	97.5	97.5	70	70	55
PD	92.5	97.5	90	75	80	47.5
PD	92.5	87.5	90	50	40	22.5
PD	87.5	92.5	85	80	65	42.5
PD	85	97.5	87.5	75	65	25
PD	85	90	85	60	60	32.5
<b>PD</b>						
Average	<b>95.5</b>	<b>95.2</b>	<b>93.3</b>	<b>81.7</b>	<b>76.0</b>	<b>44.0</b>
Total						
Average	<b>95.7</b>	<b>94.1</b>	<b>92.1</b>	<b>76.8</b>	<b>72.7</b>	<b>40.1</b>

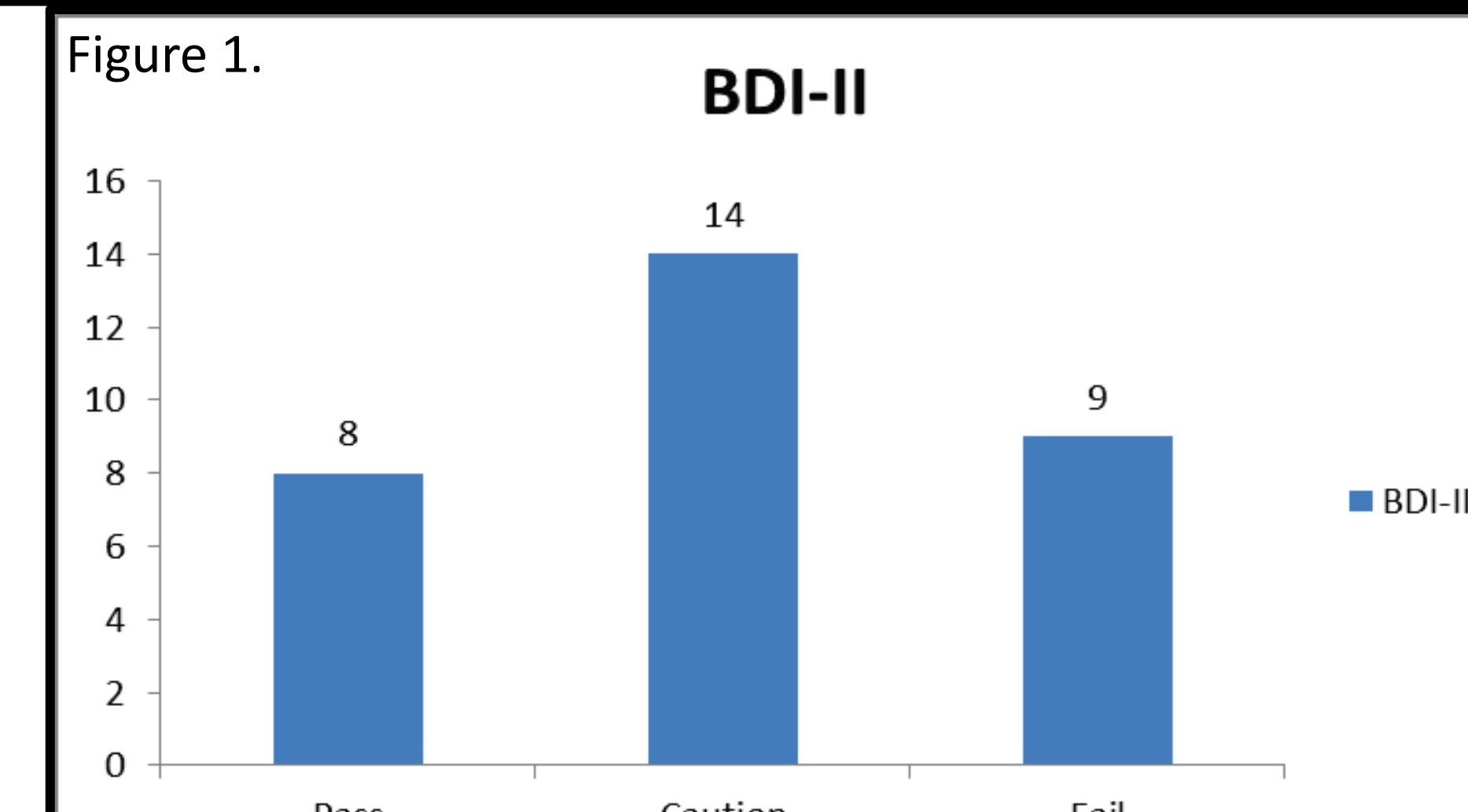


Table 4. Neuropsychological Test Performance			
Test	Group		
	Pass (19)	Caution (8)	Fail (3)
MMSE	27	28	26
BDI	8	14	9
SDMT (z)		---	
Written	-1.0	-1.3	-.7
Oral	-0.6	-1.3	-.5
TMT A (z)	-0.6	-0.7	-0.4
TMT B (z)	-1.0	-0.9	-1.2
Animals (T)	48	47	44
FAS (T)	40	41	39
RAVLT (z)		---	
Total	-.34	-.19	-1.36
Imm. Recall	-.17	-.44	-.05
Del. Recall	.36	.46	-1.0

## DISCUSSION

- This pilot study is the first to describe 1) PVT performance of DBS candidates as well as 2) the first to describe PVT performance in an older, cognitively at-risk sample who are presumed to be highly motivated.
- Of the 15 patients with cognitive impairment in this group of highly motivated older individuals, only one patient failed the PVT and did not reach the GMIP criteria.
- Future studies will include a larger sample size and will evaluate the role of mood in PVT performance.