

# Is Depression a Predictor of Outcome after Bilateral Subthalamic Deep Brain Stimulation in Patients with Parkinson's Disease?

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## INTRODUCTION

Deep brain stimulation of the subthalamic nucleus has been shown to be an effective treatment for the motor symptoms of Parkinson's disease and levodopa-related complications. Preliminary studies of the effects of DBS on psychological functioning, however, have produced inconsistent findings. At Baylor College of Medicine and The Methodist Hospital, we have been providing DBS as a treatment strategy since 1993. During the past 10 years, 89 patients received bilateral STN DBS (178 electrode implantations). We report on the depressive symptoms in our sample of DBS patients with at least 6 month outcome.

## OBJECTIVE

To evaluate the relationship between depression and motor outcome following bilateral subthalamic nucleus DBS for the treatment of Parkinson's disease.

## METHODS

**Retrospective:** A review of consecutive patients with bilateral STN DBS to assess 6 month outcome of UPDRS depression and motor scores. The UPDRS was performed on and off medication prior to surgery and on stimulator and on and off medication following surgery.

**Prospective:** A preliminary study of depression outcome following STN DBS using the Beck Depression Inventory.

## METHODS (cont.)

### Subjects

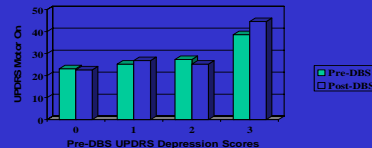
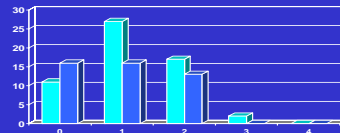
**Retrospective:** 57 patients had adequate depression and motor follow-up at 6-months following surgery.

**Prospective:** 10 bilateral STN DBS patients.

	Retrospective (n=57)	Prospective (n=10)
Gender		
Male	64	87
Female (%)	36	13
Age	63.9 (7.3)	64.6 (11.9)

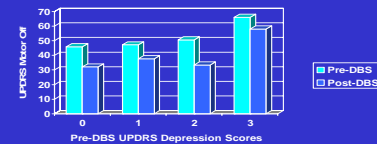
## RESULTS

Figure 1: N-back Hits for Mild PD, Moderately Severe PD, and Elderly Control Subjects



## RESULTS (cont.)

Figure 3: N-back False Alarms for Mild PD, Moderately Severe PD, and Elderly Control



## RESULTS (cont.)

### Retrospective:

- 75% of our patients showed motor improvements on stimulator "off" medication (M=8.9, SD=9.1); while 44% showed motor improvements on stimulator and "on" medication (M=17.6; SD=10.9) 6-months following surgery.
- 54% of our patients showed a decrease in depressive symptoms following DBS.
- One-Way ANOVA revealed that patients who were more depressed prior to surgery demonstrated poorer "off" motor outcome 6 months following surgery.
- No significant differences were found for UPDRS "on" scores following surgery

### Prospective:

## CONCLUSIONS

Our results suggest that working memory is adversely affected in Parkinson's disease patients at later stages of disease progression during which there is likely a greater amount of disruption in the frontostriatal neural circuitry. The causes and characteristics of this deficit should be further investigated.

## ACKNOWLEDGMENTS

This research was supported by NIH/NINDS K23 Career Training Grant NS-21889