

# Deep Brain Stimulation Versus Vagus Nerve Stimulation in the Treatment of Therapy-Resistant Depression: A Systematic Review and Meta-Analysis

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## Introduction

The World Health Organization estimates that depression will be the third leading cause of debilitating diseases by 2030. At least 20% of patients are depressants resistant to conventional treatments (TRD), such that the modern psychosurgery has been becoming part of the therapeutic arsenal

## Methods

A systematic review of the prospective clinical trials conducted in American and European centers by Medline and Pubmed from 2000 to 2016,  $p < 0.05$ ,  $n > 10$ , associated to a review of the references cited by all relevant localized studies. We obtained 66 references for vagal nerve stimulation (VNS) and 137 for deep brain stimulation (DBS), 10 studies of VNS and 3 of DBS were selected according to eligibility criteria. An exploratory meta-analysis was performed through the event rates found.

## Learning Objectives

The goal of this study is analyzes and discuss the potential for the application of VNS and DBS in the subgenual cingulate cortex in patients affected by depression medically intratable based on systematic review and meta-analysis.

## Results

We showed the presence of 643 patients with TRD in the VNS and 58 patients in DBS studies. The VNS showed a response rate after 12 months of 42% (95%, CI=31.2% to 56.7%) associated to the remission rate of 22.3% (95%, CI=16.5% to 30%). While the DBS rates were 37% (95%, CI=22.9% to 59.6%) and 26.2% (95%, CI=15.4% to 44.5%), respectively.

## Conclusions

Individual analysis of clinical trials demonstrates that both VNS and DBS are promising resources in the treatment of TRD, especially in the short and medium term, however most studies are not randomized. The meta-analysis revealed high heterogeneity due to the reduced number of clinical trials, technical differences and selection bias.

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