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## Deep Brain Stimulation of the Caudal Zona Incerta in the Treatment of Essential Tremor

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### Resumen

**Introducción:** Deep Brain Stimulation is an established and effective therapy for tremor of many forms, particularly for medically refractory Essential Tremor. The thalamic Vim nucleus is typically chosen as the target of stimulation but this is reportedly associated with less improvement in proximal tremor and the distal component of action tremor, a relatively high incidence of dysarthria and disequilibrium with bilateral stimulation, and a tendency to tolerance to stimulation. We examine the caudal zona incerta as a potential alternative target for stimulation.

**Methods:** 15 patients (7F,8M) with medically refractory essential tremor underwent bilateral DBS of the caudal zona incerta under general anaesthetic. Fahn-Tolosa-Marin Rating Scale assessments were carried out pre-operatively off medication and post-operatively off-medication/off-stimulation and off-medication/on-stimulation. Outcome measures included % change between tremor scores and subscores, SF-36 Health Survey and surgical/stimulation related complications.

**Results:** Total Tremor Score improved by 73.8%. Part A Score by 86.6%. Combined postural/action component by 86.1%. Components of axial tremor improved significantly as well as Part B Scores (60%), Part C Scores (80%) and Quality of Life. These results are maintained over 4 year follow-up, with no significant increase in voltage requirements. Complications included 1 wound infection and 3 patients experienced mild/reversible stimulation related dysarthria.

**Conclusions:** The caudal zona incerta is a viable alternative stimulation target, producing potentially superior results maintained over long follow-up, at low voltages, with no tolerance to stimulation, with low rate of stimulation related complications.