

intracranial arteries constitutes conclusive evidence that the brain is dead, there is apparent discrepancy between the BF, and sufficient cerebral perfusion; In 15% of patients with confirmed clinical diagnosis of brain death, BF is still preserved. In these patients, cerebral perfusion is significantly impaired suggesting that cerebral perfusion rather than BF more accurately assesses brain function. We aim to present a history of brain death, its pathophysiology, and ancillary tests utilized for its diagnosis—specifically CT Perfusion studies. Methods: A literature search using titles and key terms was conducted for articles containing brain death ancillary testing diagnosis, and CTP as primary focus. Results: Across selected studies, CTP diagnosed brain death with 100% positive predictive value, as none of the patients were proven not-dead on follow-up. The early prediction of mortality outcome in these patients with proven high mortality rate may help decisions for withdrawal of life support. It may also facilitate procurement of organs for transplants. Conclusions: Although clinical assessment is the gold standard method of brain death determination, CTP has shown promising results that could alter our current clinical approach.

NEUROSURGERY (CNSS) FUNCTIONAL NEUROSURGERY AND PAIN

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Functional neuroimaging signatures associated with analgesic effects of neuromodulation for chronic pain and their value in predicting treatment outcome

*L Boone (St John's) T Noble (St John's) A El Helou (Moncton)**
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Background: Responses to invasive neuromodulation therapy for chronic pain are highly variable after several months of sustained treatment, with some experiencing a complete loss of therapeutic effect. We sought to assess whether functional neuroimaging can provide a biomarker for treatment success and whether these biomarkers offer value in predicting treatment response. Methods: We searched Ovid MEDLINE and EMBASE from 1967 to 2022, including prospective studies correlating functional neuroimaging signatures with treatment response after surgical implantation. Results: After considering 355 studies for initial review, 22 studies were included. While there was significant heterogeneity in experimental design, preliminary findings suggest that differential regional cortical activation profiles and signatures can be employed to differentiate good from poor therapeutic responders. Three studies correlated pre-operative functional imaging with treatment effects post-implantation. For example, baseline activation patterns of specific brain regions on functional imaging modalities such as ¹¹C-diprenorphrine PET and Tc-99m-SPECT significantly correlated with therapeutic response to motor cortex stimulation, and spinal cord stimulation (SCS), respectively. Conclusions: The included studies demonstrate the potential for functional imaging to predict the likelihood of successful neuromodulation treatment. The concept is

relatively unexplored in the literature and could benefit from more studies with larger sample sizes to confirm clinical utility.

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Effectiveness of palliative focal resective surgery in intracranial EEG confirmed multifocal intractable epilepsy in adult patients

G Tamura (Calgary) S Wiebe (Calgary) C Josephson (Calgary) A Salmon (Calgary) S Singh (Calgary) W Hader (Calgary)*
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Background: Effectiveness of “palliative resections” of a dominant epileptogenic focus in adults with multifocal intractable epilepsy confirmed on intracranial EEG has rarely been reported. Methods: We retrospectively reviewed our database to identify patients who underwent focal resection after confirmation of multiple seizure foci on intracranial EEG. Results of presurgical investigations, intracranial EEG, procedures, complications and outcome were collected. Results: A total of 17 patients underwent palliative resection (8 left, 9 right). Preoperative MRI revealed malformations of cortical development in 6 patients, and MTS in 6 patients. Intracranial stereo EEG revealed 8 bilateral and 9 unilateral multifocal epileptogenic foci. Surgical procedures included anterior temporal lobectomy (ATL) or selective amygdalohippocampectomy in 4 patients, ATL plus additional cortical resection in 7 patients, and extratemporal resection in 6 patients. One patient had dysphasia post ATL and a second patient had worsened cognitive dysfunction post extended frontal lobectomy. Favorable seizure outcome (Engel class I and II) was achieved in 10 patients (58.8%). Pathology revealed focal cortical dysplasia in 6 patients and hippocampal sclerosis in 5 patients. Conclusions: Palliative resection of a dominant epileptogenic focus confirmed by intracranial EEG is effective in carefully selected adult cases of intractable epilepsy, particularly in patients with lesional epilepsy.

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Effect of stimulation site on brain network activity and phonemic verbal fluency: an fMRI study.

B Santyr (Toronto) M Cohn (Toronto) J Germann (Toronto) A Ajala (Niskayuna) J Qiu (Niskayuna) A Boutet (Toronto) A Lozano (Toronto)*

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Background: In Parkinson's disease, deep brain stimulation (DBS) of the subthalamic nucleus (STN) or globus pallidus internus (GPi) produces comparable motor benefits. Although both increases the risk of cognition and verbal fluency (VF) decline, the risk is greater following STN-DBS. The consequences of stimulating these different sites on brain network activity is unknown. We use functional magnetic resonance imaging (fMRI) during in vivo stimulation to investigate differences between STN-DBS and GPi-DBS and correlate with change in VF. Methods: Left-sided, stimulation-cycling block-design fMRI was acquired at 3-Tesla in 51 STN-DBS and 15