A Brain Computer Interface to Monitor Depression

Background: Assessment of depression has traditionally relied on clinical observations and patient self-reports. Comparison between patients and within patients at different time points is thus difficult because of the lack of an objective and quantitative measure. There is a need for an instrument or device that can objectively measure depression to assist in the diagnoses, treatment, and evaluation of treatment efficacy.

Technology Description: A device consisting of an EEG headset and mobile application that allows for objective monitoring of depression. There has been evidence that in depression, the intrinsic resting state networks dominate over the extrinsic networks. A Depression Index can thus be calculated from the ratio of theta (intrinsic) to alpha (extrinsic) rhythm activity as an objective measure of depression. The downloadable mobile application assists in signal recording, visualization and in providing feedback.

Applications: • An objective measure that can be used pre- and post-treatment to assess impact of therapy
  • The real time Depression Index could be incorporated into a game as a novel therapy

Stage of Development: We have found a frequency specificity to intrinsic and extrinsic resting state networks through correlations of resting state fMRI and ECG data, which validates the use of electrophysiology recordings to monitor depression.

Patents and Publications: 62/280368 (Pending); Resting State Electrophysiology

Inventors: Eric C Leuthardt, MD, Department of Neurosurgery

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