Algorithm for Non-invasive Source Localization of Neural Activity

Technology No. z05027

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Non-invasive EEG Analysis Provides 3D Source Localization

An algorithm has been developed that can non-invasively determine the location of neural activity in the brain. Non-invasive measurements made by scalp EEG are processed to provide 3D localization within the brain that can be used for surgical planning and significantly reduce cost and potential risk in surgical treatment of epilepsy patients. This technique will reduce cost and risk to patient as well as provide accurate measurements of bioelectrical sources to use as information in further medical treatment.

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Epileptic Source Localization for Surgical Planning

Epilepsy is a neurological disorder characterized by surges of electrical activity that produce seizures that can be debilitating. For those not responsive to pharmaceutical treatment, surgical resection may be the best option. While MRI only delineates lesions and EEG only provides surface measurement, the gold standard for surgical planning is intracranial EEG (iEEG). Intracranial electrodes are placed on the surface of the exposed brain and patients are monitored for extended periods of time. Due to the location of the epileptic sources, a patient may undergo this lengthy procedure with risk of infection only to learn that they are, in fact, not a surgical candidate due to the location of the epileptic source.

BENEFITS OF BIOELECTRICAL LOCALIZATION:

- Provides an accurate localization of bioelectrical sources that may be comparable to that obtained by the gold standard intracranial EEG
- Allows for non-invasive surgical planning
- Reduces time in operating room (OR), risks and costs

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