

Simplified System to Accurately Measure a Patient's EEG Response to a Cochlear Implant

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BRIEF DESCRIPTION

Researchers at the University of California, Irvine (UCI) have developed a high sample rate, high bandwidth single channel acquisition system and method to measure a patient’s EEG response to an electrical stimulus from a cochlear implant. This system and method may be used to assess a patient’s response to electrical stimuli from a CI and then to tune the performance of a cochlear implant (CI) to match a patient's hearing needs.

FULL DESCRIPTION

The process of fitting or assessing the function of a cochlear implant (CI) involves an audiologist carefully selecting the correct speech processing strategy and setting the electrical stimulation parameters for each individual CI patient. The audiologist stimulates the CI electrode, elicits a verbal response from the patient and accordingly the audiologist adjusts the settings on the CI.

Given that each patient has his or her unique response to an electrical stimulation from a CI, this creates a large variability. Also pediatric and new CI patients are still learning to understand speech with their implanted CIs so the above described method may not be the best suitable method.

To overcome this variability, recording and measuring late auditory evoked potentials (LAEP) as the brain’s response to CI stimuli may provide a useful objective metric of performance in CI patients. However, the CI produces a large electrical artifact that contaminates the LAEP recordings and this artifact prevents the accurate interpretation of the LAEP for the use of CI fittings.

Researchers at UCI have developed a high sample rate, high bandwidth single channel acquisition system and method that removes the artifact found in LAEP recordings. The artifact removal allows for the accurate measurements of LAEPs in CI patients from single channel recordings. This increases the feasibility and utility of LAEP recordings as an accessible objective measure of CI function.

ADVANTAGES

This single channel system does not require the purchase and/or use of expensive multi-channel acquisition systems. Multi-channel systems increase the patient preparation time as a full EEG cap must be used and in CI patients it is difficult to position the EEG cap over the behind the ear processor and magnetic link of the CI.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,630,008	04/25/2017	2013-498

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OTHER INFORMATION

KEYWORDS

Cochlear, Hearing Loss, Implants

CATEGORIZED AS

- » Medical
- » Devices

RELATED CASES

2013-498-0, 2012-122-0

TESTING

This system and method has been tested in patients.

UCI Beall
Applied Innovation

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