

## **Abstract EFAS/DGA 2007**

### **CAEP measurement of sound discrimination of CI patients in noise**

Igelmund, P. (1), Meister, H. (2), Brockhaus-Dumke, A. (3), Fürstenberg, D. (1), von Wedel, H. (1), Walger, M. (1, 2)

University of Cologne:

(1) ENT Department

(2) Jean-Uhrmacher-Institute for clinical ENT research

(3) Department of Psychiatry and Psychotherapy

**Background/aims:** For non-cooperative patients such as infants and patients with multiple handicaps, evaluation of hearing and understanding in noise with subjective audiological tests is difficult. Our project aims at establishing cortical auditory evoked potentials (CAEP), especially event-related potentials (ERP), as objective measures of auditory discrimination ability of cochlear implant (CI) patients in noise.

**Methods:** Acoustic signals (tonal and speech sounds) are presented to postlingually deafened CI patients in auditory discrimination tasks under different signal-to-noise ratios. CAEPs are recorded with two EEG systems: a 32 channel Neuroscan 32 (Neuroscan) and a 128 channel GES 250 (Electrical Geodesics). The electrophysiological results are compared to psychophysically ascertained discrimination abilities.

**Results and Conclusions:** CAEP recordings from CI patients are at risk to be contaminated by electrical artifacts resulting from the activity of the implant. Time-locked to the stimulus and outlasting it, these artifacts appear in the averaged recordings and may mask even late components of the biological responses. Multi-electrode recordings reveal the patient-specific spatial dispersion of the artifacts and, thus, allow the analysis of the CAEPs from selected, non-contaminated channels. The amplitudes and the spatial dispersion of the artifacts differ between the two EEG systems used in this study in accordance with the different properties of the electrodes and amplifiers. With both systems, we could identify obligatory and event-related potentials from all patients investigated so far. First results are presented and discussed.

Supported by the Marga und Walter Boll Stiftung and Cochlear Europe Ltd.

