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&amp;

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## Dual Diagnosis

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### Intra-operative monitoring of auditory pathways: A new faster BAEP's technique

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CE Chirp© LS is a new acoustic stimulus designed to provide faster detection of larger amplitude BAEP's waves. CE Chirp© LS BAEP's are performed in the same way as click BAEP's. Surface electrodes are placed at the vertex (Cz) and on each earlobe (A1 and A2). Filters bandwidth are 150-1500 Hz. Two channels are used: A1-Cz and A2-Cz. Stimuli are presented by inserting earphones with alternate polarity at 41.1 Hz, but can also be presented at higher frequencies. Sound pressure range is 80 to 100 dB nHL, choosing the sound pressure level giving the clearest waves. Controlateral ears are masked by white noise at 50 dB nHL. CE Chirp© LS stimulus has the same spectrum and the same calibration as a usual square wave click stimulus. Acoustic energy from low, mid and high frequency components of CE Chirp© LS stimulus reaches all the regions of the cochlea at the same time. This allows neurons in the cochlea to fire synchronously. This change in stimulus presentation results in a CE Chirp© LS BAEP's wave V of double amplitude than click BAEP's wave V. Double amplitude of wave V translates in a reduction of test time. SNR improvement is equal to the square root of the number of trials averaged. If we want to achieve the same Signal/Noise Ratio (SNR) of click ABR, if the response is 2 times bigger, then we need  $1/(2)^2$  of sweeps, that means only 25%. So, instead of 2000 sweeps we need only 500. This is a quarter of test time. Combined with high frequency of stimulation, e.g. 63 Hz, we can have a very clear BAEP's in 5-15 seconds. In our experience, CE Chirp© LS BAEP's monitoring can be performed up to four times faster than click BAEP's. Neurophysiologists can be able to inform neurosurgical equipe in few seconds about variations of wave V parameters.

#### Biography

Ettore Di Scipio is an MD and Clinical Neurophysiologist at San Filippo Neri Hospital in Rome. He is shifting his focus from neurological investigation to nervous system protection. He treats both inpatients and outpatients, and has expertise in electromyography, intraoperative neurophysiological monitoring, electroencephalography and polysomnography. Currently, he is studying new applications of "CE-Chirp© BAEP's stimulus" in Neurology.

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