

CHARTR EP with VEMP - the ideal complement to CHARTR VNG/ENG

ICS CHARTR EP 4.0 with Vestibular Evoked Myogenic Potentials (VEMP)

VEMP is a simple procedure, which is presently demonstrating a necessary role in the routine vestibular test battery. Most clinical tests commonly used today to diagnose dizzy patients, such as VNG/ENG, evaluate the semi-circular canals but do not consider the remaining vestibular organs. The saccule, which is one of the two otolith organs, also plays an important part in the vestibular system. It is easy to test its condition because it can elicit a short latency electromyogram (EMG) when evoked by a high-intensity acoustic stimulus, which can be measured with CHARTR EP. This response can be used to assess the sacculollic pathway of dizzy patients. CHARTR EP can be integrated with CHARTR

VNG/ENG supplying the only complete diagnostic package for assessment of vestibular disorders.

The VEMP application is the ideal complement to CHARTR VNG/ENG

VEMPs are small muscle contractions in the neck that normally appear in response to a high intensity sound entering the ear. These responses are proposed to originate in the saccule and are being shown to provide unique information about vestibular function.

The protocol provided with CHARTR EP can measure these evoked potentials non-invasively with surface electrodes applied to



the neck muscles (sternocleidomastoids, SCM) while the patient sits up in a relaxed and comfortable position. The patient is instructed to turn his/her head strongly to the side opposite the test ear. The neck must be turned enough to allow the SCM muscle to tense (when in the proper position, you can see the SCM surface) Clicks or tone bursts (typically 95-97 dB nHL) are then presented to the test ear. The responses are averaged and amplitude and latency measurements are reported.

The CHARTR EP VEMP protocol is adopted from research studies currently being conducted in respected clinics and universities using this equipment.

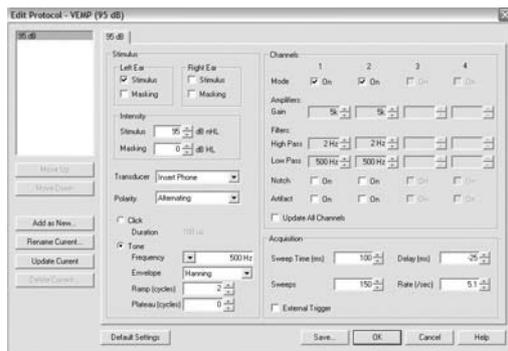


Figure 1. ICS CHARTR default protocol for VEMP

VEMPs are analyzed and the results are used to provide clinical conclusions regarding functionality of the saccule and related nerve pathway. A normal responding saccule will elicit a short latency, relatively large amplitude response. VEMPs are recorded from both sides and the responses compared to each other. Asymmetries in responses suggest a possible abnormality.

A person with a normal vestibular system should show responses with an average latency of 11-14 ms for the positive peak and 19-22 ms for the negative peak (Akin et al, 2004).

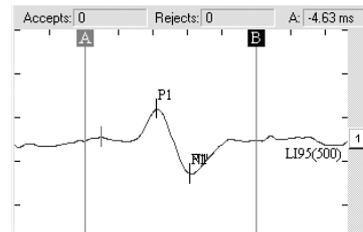


Figure 2. Normal VEMP on adult patient.

The amplitude can vary depending on several factors including electrode placement, stimulus intensity and muscle tension.

Sensorineural hearing loss does not appear to affect VEMPs.

Abnormalities that can possibly be identified with VEMPs include:

- Vestibular nerve disorders
- Ménière's disease
- Multiple sclerosis and other central nervous diseases
- Brainstem stroke

References:

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- Versino M, Colnaghi S, Callieco R, Bergamaschi R, Romani A and Cosi V (2002). "Vestibular evoked myogenic potentials in multiple sclerosis patients." Clin Neurophysiol 113(9): 1464-9.
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