

AUDERA PRO

CERVICAL VEMP (cVEMP) QUICK GUIDE

The operating manual contains information pertinent to the use of the GSI Audera Pro, including safety information, as well as maintenance and cleaning recommendations. Read the manual in its entirety prior to use of the Audera Pro on a patient.

TESTING ENVIRONMENT

It is important that the test environment be conducive to collecting good quality test data and free from excessive noise. The GSI Audera Pro should be used in an acoustically quiet testing environment. To minimize the amount of electrical noise, it is recommended that the Audera Pro be plugged directly into a dedicated, earth-grounded electrical outlet. Any unnecessary equipment such as computer monitors, cellphones, fluorescent lights, electronic beds, etc. should be turned off during testing. A non-metal, comfortable bed that allows the patient to recline about 30 degrees may be helpful. Suitable area allowing for placement of the VEMP EMG monitor mounted on the tripod should be available if utilized during testing.

PREPARE THE SOFTWARE

1. From the opening window, click on the Search Patient icon to select an existing patient, or click on the New Patient icon to create a new patient file and enter First Name and Last Name (required). Click OK.
2. Select the EP icon to launch the evoked potential module.
3. Select Load Settings to select a cVEMP protocol. If EMG rectification will be utilized during analysis, select a protocol with block averaging enabled.

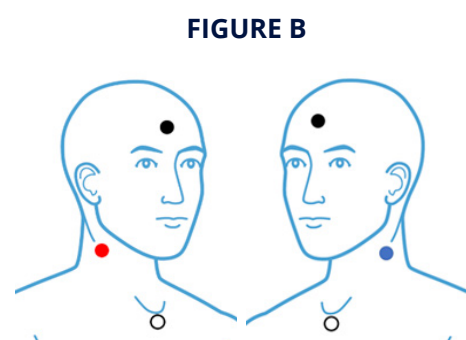
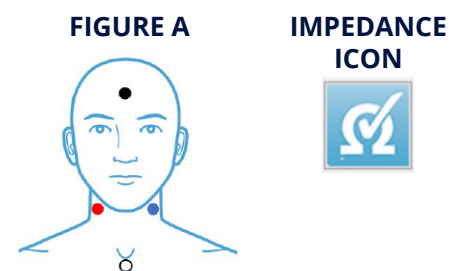


PREPARE THE PATIENT

1. Prepare the skin at four locations: right and left neck, high forehead, and just below the sternal notch.
2. Using the 4-snap lead patient cable, apply the snap electrodes on the patient's head as shown in Figure A. Red and blue electrodes should be placed on the largest part of the SCM (sternocleidomastoid muscle) which is approximately halfway between the ear and the sternum when the head is turned as shown in Figure B.

NOTE: This montage will result in downward deflection for P1 and upward deflection for N1.

3. Check the electrode impedance by selecting the Impedance icon from the side toolbar. Under 5 K ohms is ideal. If necessary, re-prepare the impedance is higher than 5k ohms.

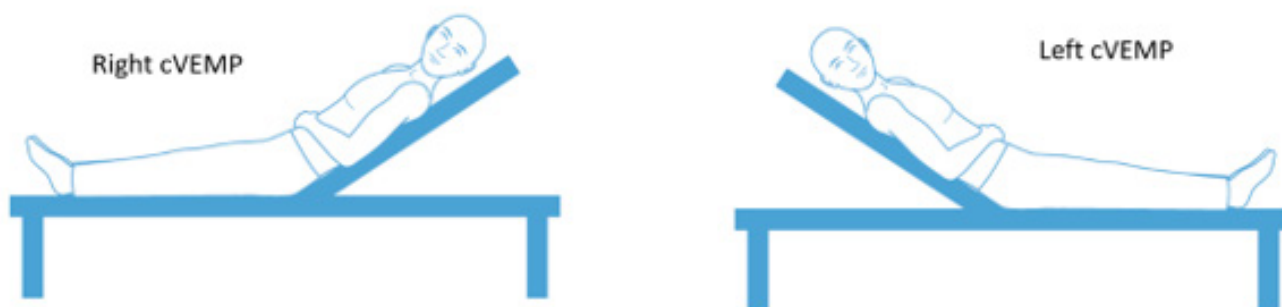


PATIENT POSITION AND TEST INSTRUCTIONS

The amplitude of the cVEMP is directly affected by the amount of the neck muscle contraction; therefore, efforts should be made to ensure this contraction is equal for both right and left recordings. The VEMP EMG biofeedback monitor provides a visual signal corresponding to the status of a patient's muscle activity so that the patient can voluntarily control the muscle contraction. If EMG feedback to the patient is not available, utilizing the procedure shown below can assist in keeping the contraction approximately equal when both ears are evaluated.

1. Place the patient in a reclining position. See Figure C.
2. Turn the patient's head away from the ear being stimulated. When stimulating the right ear, the patient's head should be turned to the left. When stimulating the left ear, the patient's head should be turned to the right.
3. Instruct the patient to lift their head off the table slightly when they hear the stimulus as shown below. The patient should be informed that the stimulus will be loud but only present a short time.

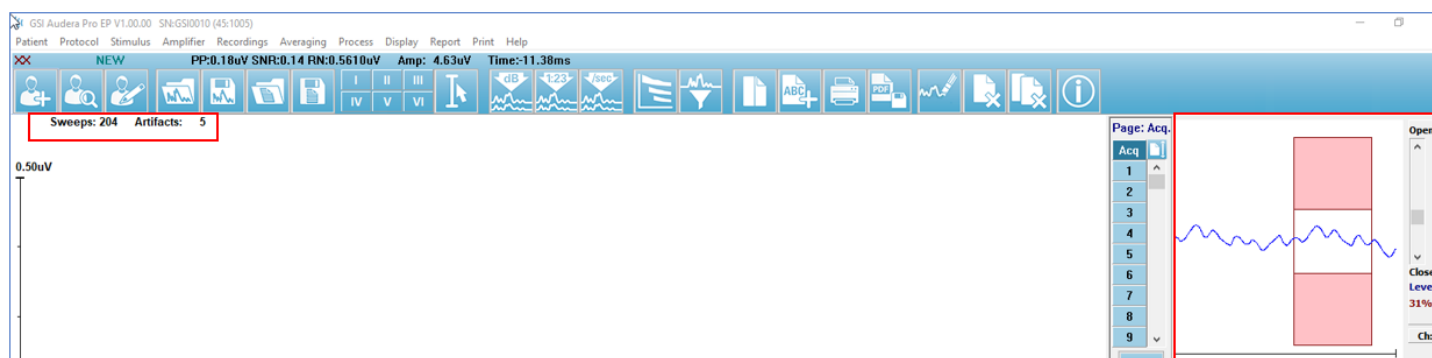
FIGURE C



PERFORM THE cVEMP COLLECTION

1. Review/change the collection parameters in the Collection toolbar.
2. Begin the collection by selecting the Acquire button from the Collection toolbar. At the same time, instruct the patient to lift their head. Keep in mind that the patient may fatigue quickly.
3. During collection, monitor the incoming EEG, ensuring it falls within the acceptable range (white) and review the running sweep accepted and rejected counts in the upper left side of the collection screen.

COLLECTION SCREEN



4. Replicate the response and repeat test in the other ear.

VEMP ANALYSIS MODULE

1. Launch the VEMP Analysis Module by selecting the VEMP icon in the opening window.
2. Select one wave per ear to be analyzed from the Open Records window.

NOTE: If 2 or more waveforms are selected, a grand average will be displayed for analysis.

VEMP
ICON



3. Mark P1 and N1 by dragging the markers to the desired location on the waveform. See Figure D. The Asymmetry Ratio will be automatically calculated.

Approximate latencies are: P1 occurs about 14 - 20.5 msec

N1 occurs about 22 - 29.3 msec

4. Select the Save Record icon to save a VEMP report in the EP module.

**SAVE
RECORD**



OPEN RECORDS

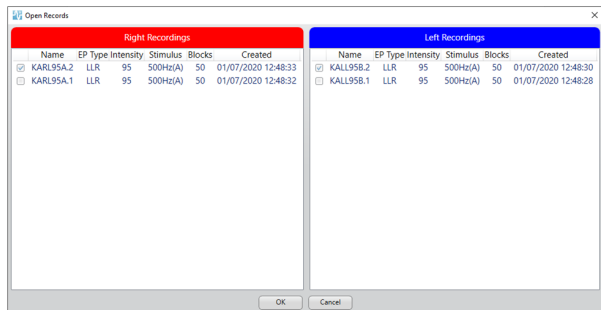
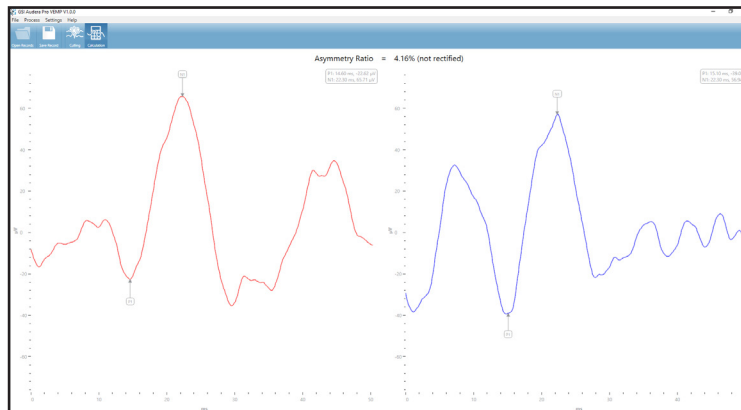


FIGURE D



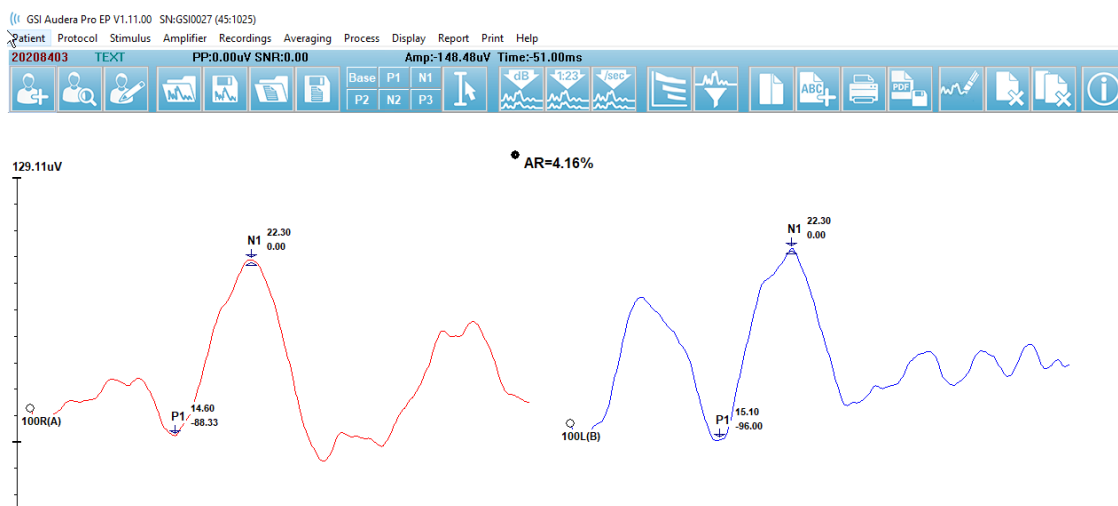
REVIEW AND PRINT THE REPORT

1. Return to the EP Module.
2. Select the Load Report icon or select Report > Load Report.
3. Select and open the VEMP report just created.
4. The marked waveforms and the Asymmetry Ratio (from the VEMP Analysis Module) will load on the page as shown in figure E.

**LOAD
REPORT**



FIGURE E



5. Arrange the waveforms as needed.
6. To edit the Asymmetry Ratio text, right click on the text handle (small circle to the left AR) and select Edit.
7. To add test summary, Go to Report > Add Text. Move the text anywhere on the page.
8. To save edits select Report > Save Report.
9. Select Print > Print All Pages PDF Preview to view the report and select the printer icon to print the report.

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