

# Using a dry electrode EEG device during balance tasks in healthy young-adult males: Test-retest reliability analysis

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**Background:** The analysis of brain activity during balance is an important topic in different fields of science. Given that all measurements involve an error that is caused by different agents, like the instrument, the researcher, or the natural human variability, a test-retest reliability evaluation of the electroencephalographic assessment is a needed starting point. However, there is a lack of information about the reliability of electroencephalographic measurements, especially in a new wireless device with dry electrodes.**Objective:** The current study aims to analyze the reliability of electroencephalographic measurements from a wireless device using dry electrodes during two different balance tests.**Method:** Seventeen healthy male volunteers performed two different static balance tasks on a Biodex Balance Platform: (a) with two feet on the platform and (b) with one foot on the platform. Electroencephalographic data was recorded using Enobio (Neuroelectronics). The mean power spectrum of the alpha band of the central and frontal channels was calculated. Relative and absolute indices of reliability were also calculated.**Results:** In general terms, the intraclass correlation coefficient (ICC) values of all the assessed channels can be classified as excellent ( $>0.90$ ). The percentage standard error of measurement oscillated from 0.54% to 1.02% and the percentage smallest real difference ranged from 1.50% to 2.82%.**Conclusion:**

Electroencephalographic assessment through an Enobio device during balance tasks has an excellent reliability. However, its utility was not demonstrated because responsiveness was not assessed. © 2015 Taylor & Francis.

Balance

EEG

motor control

power spectrum

reliability

adult

alpha rhythm

body equilibrium

brain cortex

electrode

electroencephalography

human

male

normal human

physiology

reproducibility

spectroscopy

wireless communication

young adult

Adult

Alpha Rhythm

Cerebral Cortex

Electrodes

Electroencephalography

Healthy Volunteers

Humans

Male

Postural Balance

Reproducibility of Results

Spectrum Analysis

Wireless Technology

Young Adult