

# Applying extrapolated normal values for a handheld nerve conduction study device intended to use in carpal tunnel syndrome



## Introduction

Previously we participated in developing a handheld nerve conduction study device for carpal tunnel syndrome diagnosis to be used in areas without easy access to clinical neurophysiology services.

In order to obtain the preferable limits for abnormality, we decided to apply the E-norms method to our data.



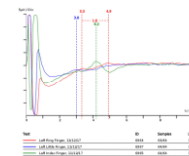
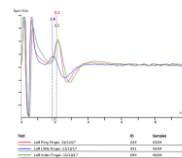
## Methods

4860 patients were included in the study.

We performed median and ulnar nerve orthodromic sensory conduction studies by stimulating index, ring and little fingers.

We measured peak latencies and calculated the differences between index and little finger latencies and between the peak latencies of a bifid ring finger response.

The E-norms method was then applied to the data.

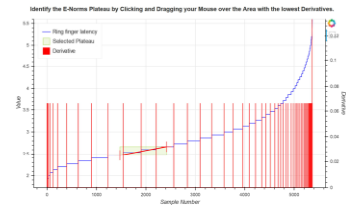
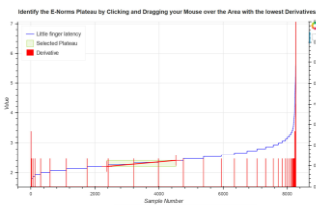
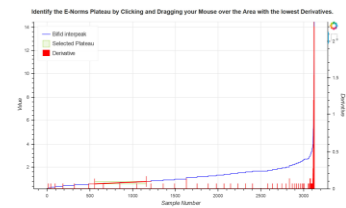
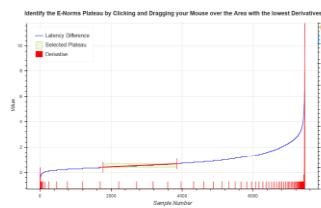


## Results

For 7451 values of the latency difference between index and little finger the E-norms method returned a mean of 0.52 ms with SD of 0.09.

Respectively, mean and SD of the ring finger bifid response inter-peak latency was 0.79 ms and 0.12.

Mean and (SD) for little, ring and index finger latencies were 2.32 (0.05), 2.58 (0.06) and 2.88 (0.09) ms.



## Conclusions

Compared to our prior normal values as well as published normative data, the E-norms method returned a slightly lower peak latency difference between index and little finger measures.

On the other hand, for the ring finger bifid response the value was somewhat higher, compared to normal values.

With very short inter-peak interval, the bifid or angulated response was occasionally interpreted as a single peak response, thus resulting in a higher value.

In our opinion, the E-norms method provided a more preferable limit of abnormality for the latency difference between index and little finger studies.