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## Novel approach in diagnosing of peripheral muscles diseases by EMG signal dynamic

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### Introduction

The needle electromyography (nEMG) is the method of choice used to diagnose muscular disorders. nEMG is safe but painful and requires at times discontinuation of anticoagulant therapy.



Needle EMG

Invasive, painful, requires anticoagulant management



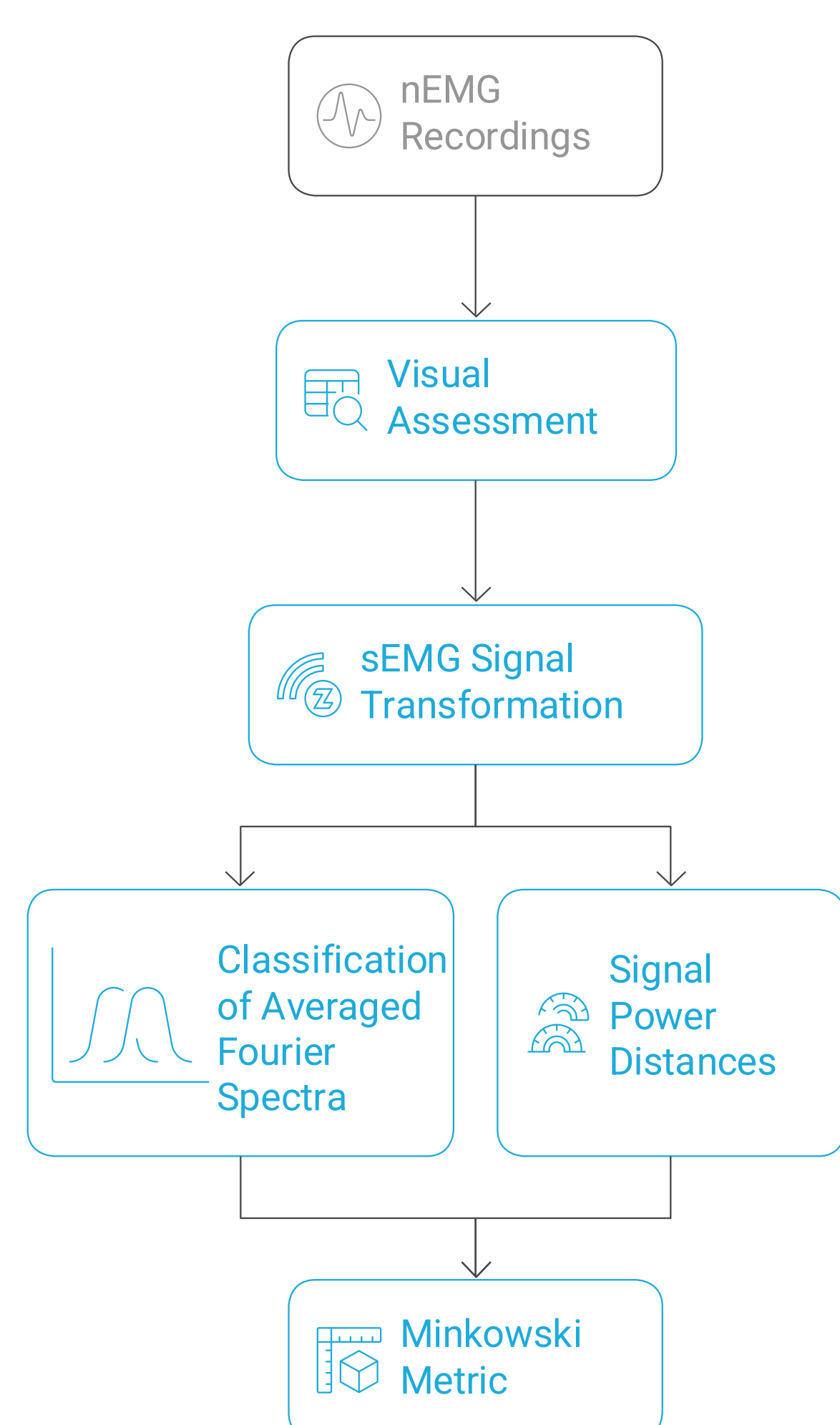
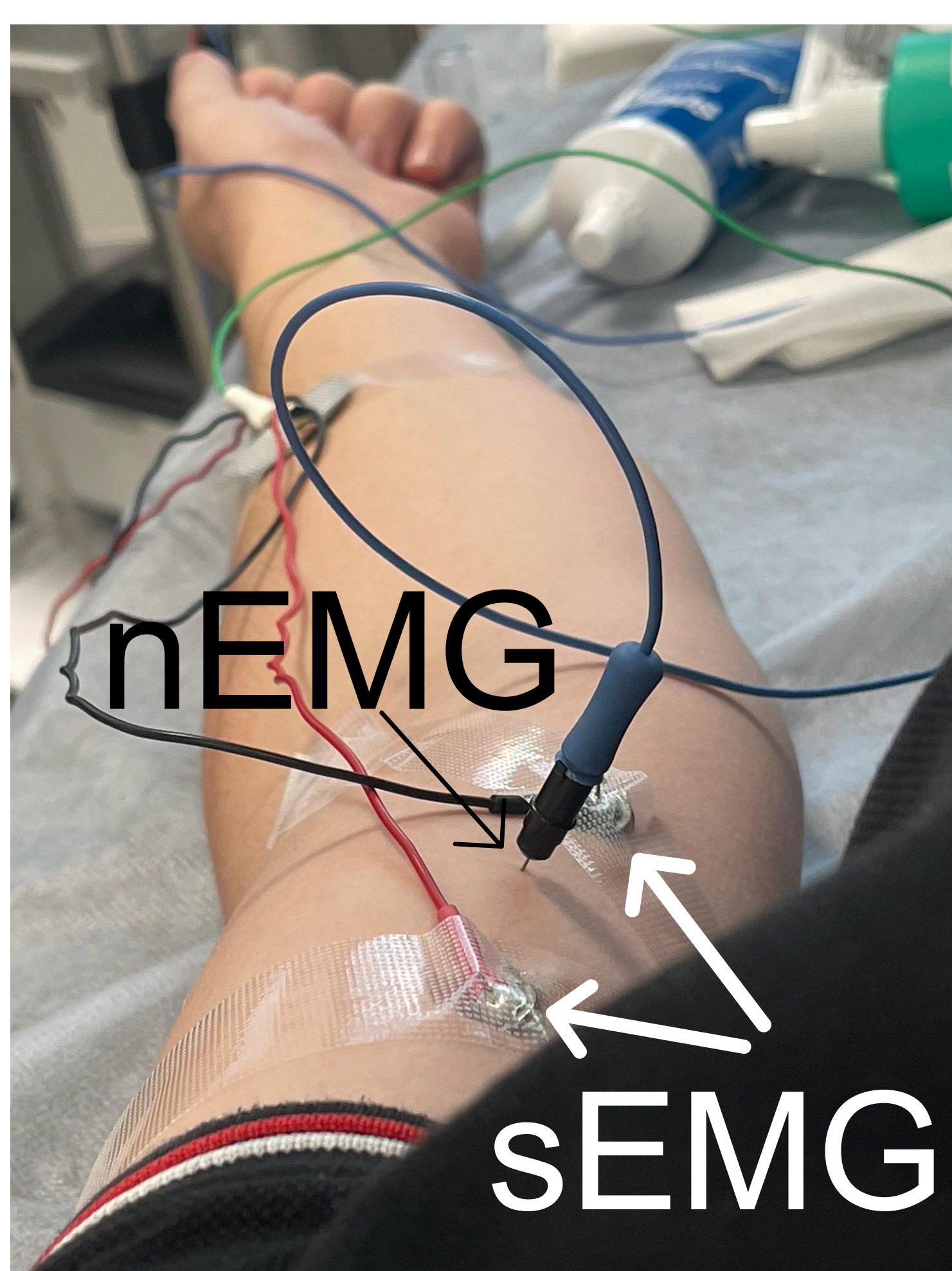
Surface EMG

Non-invasive, painless, no anticoagulant management

In this study, we investigated reliability of EMG recorded with surface electrodes (sEMG) with subsequent digital transformation in detecting myopathic and neurogenic changes.

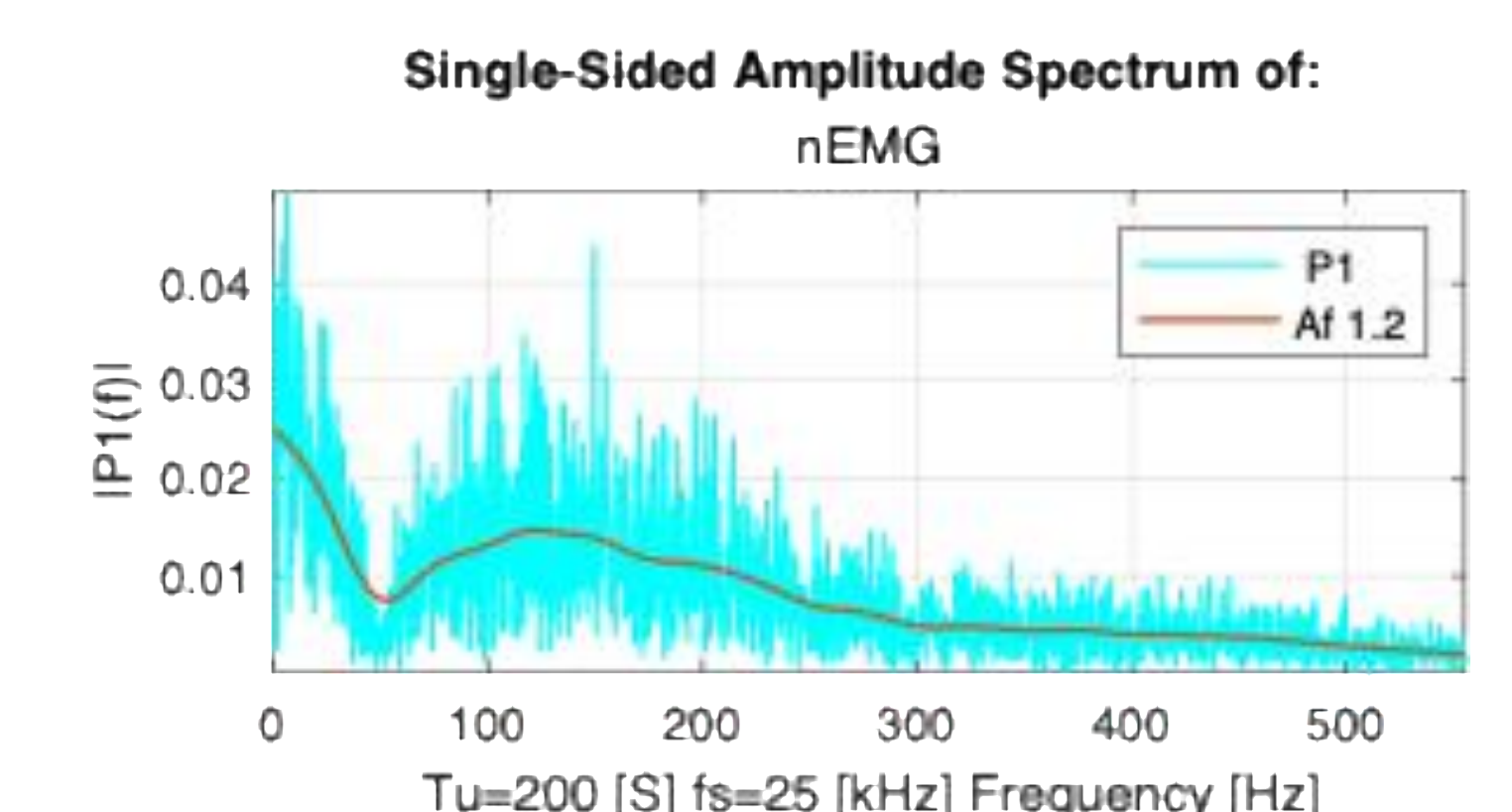
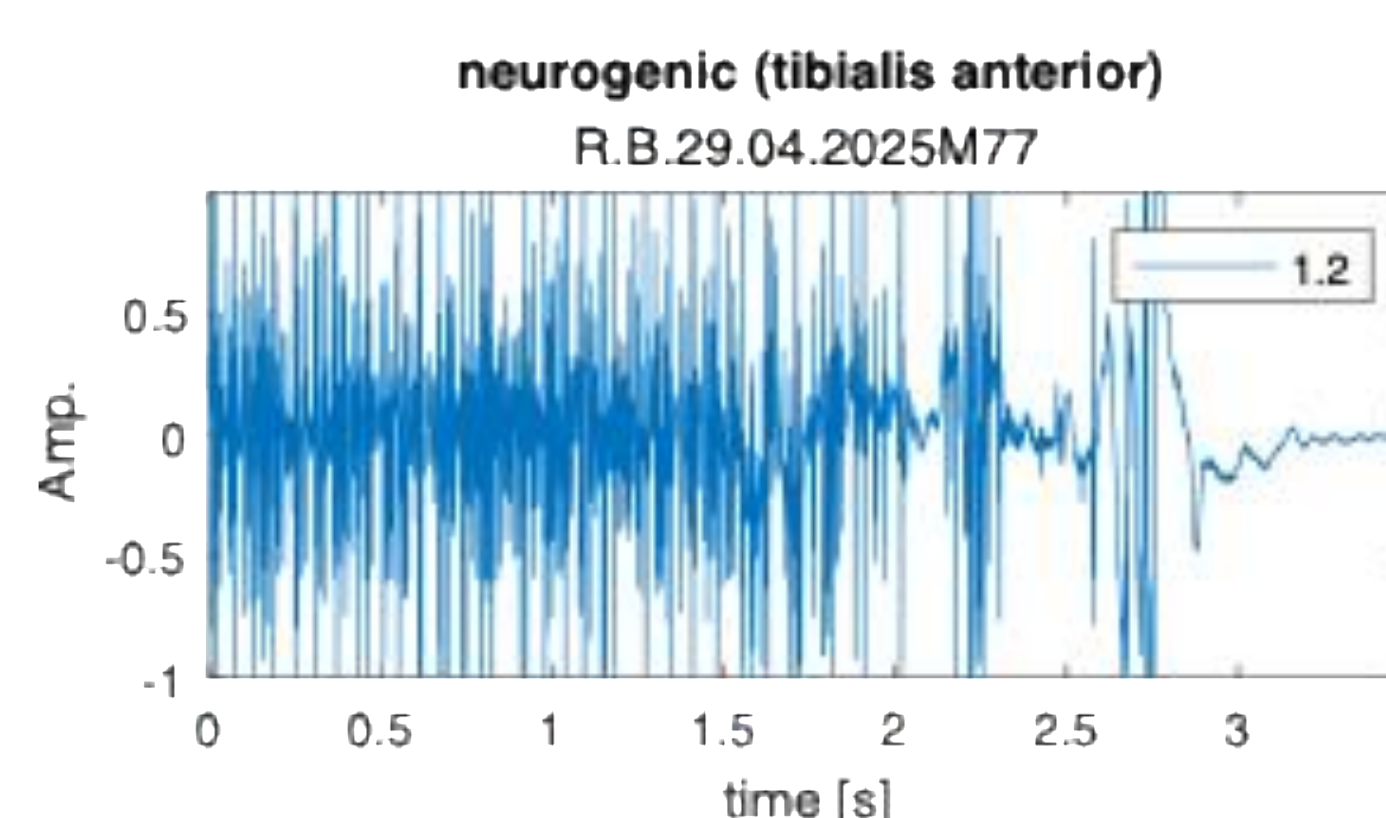
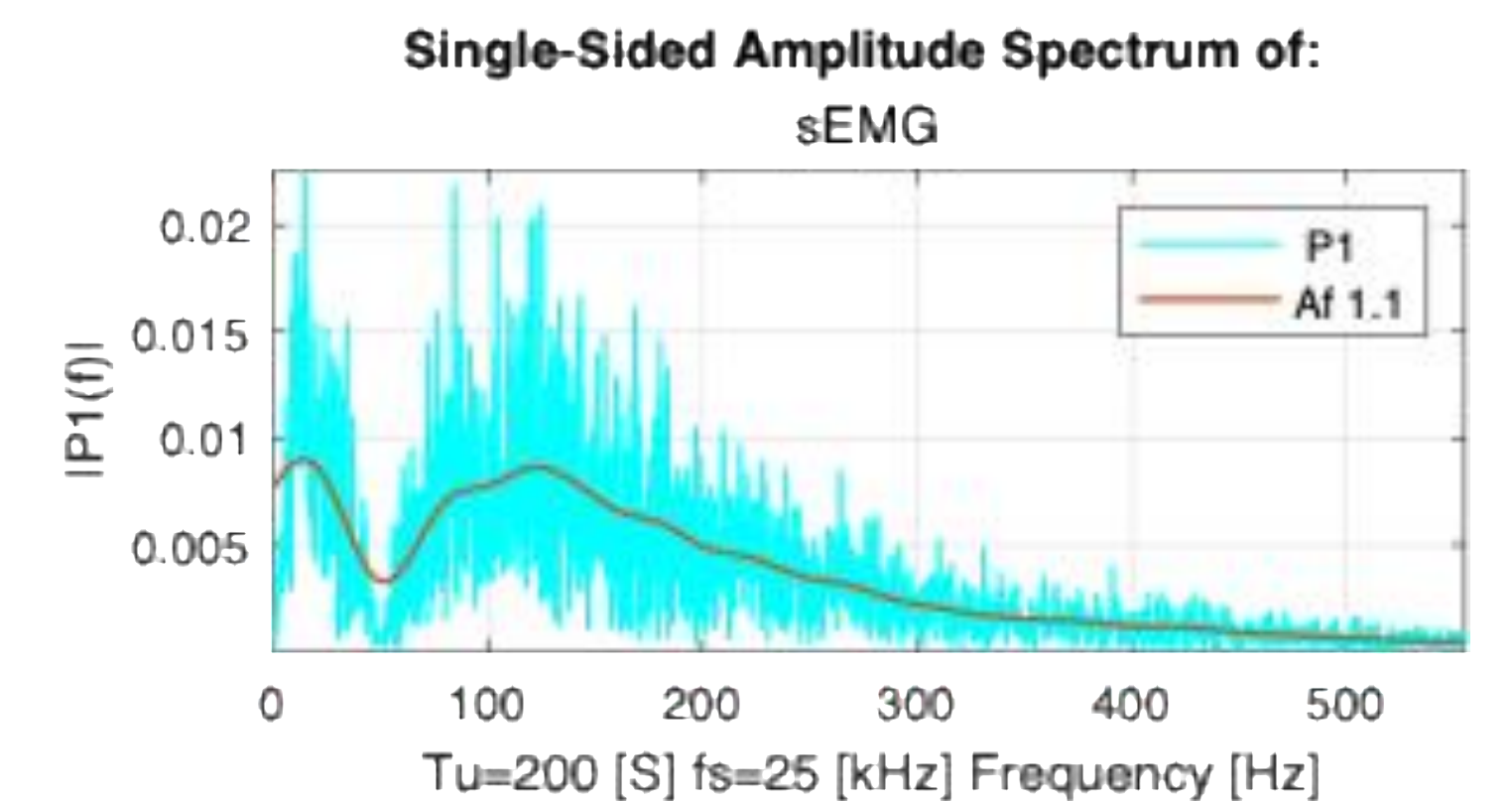
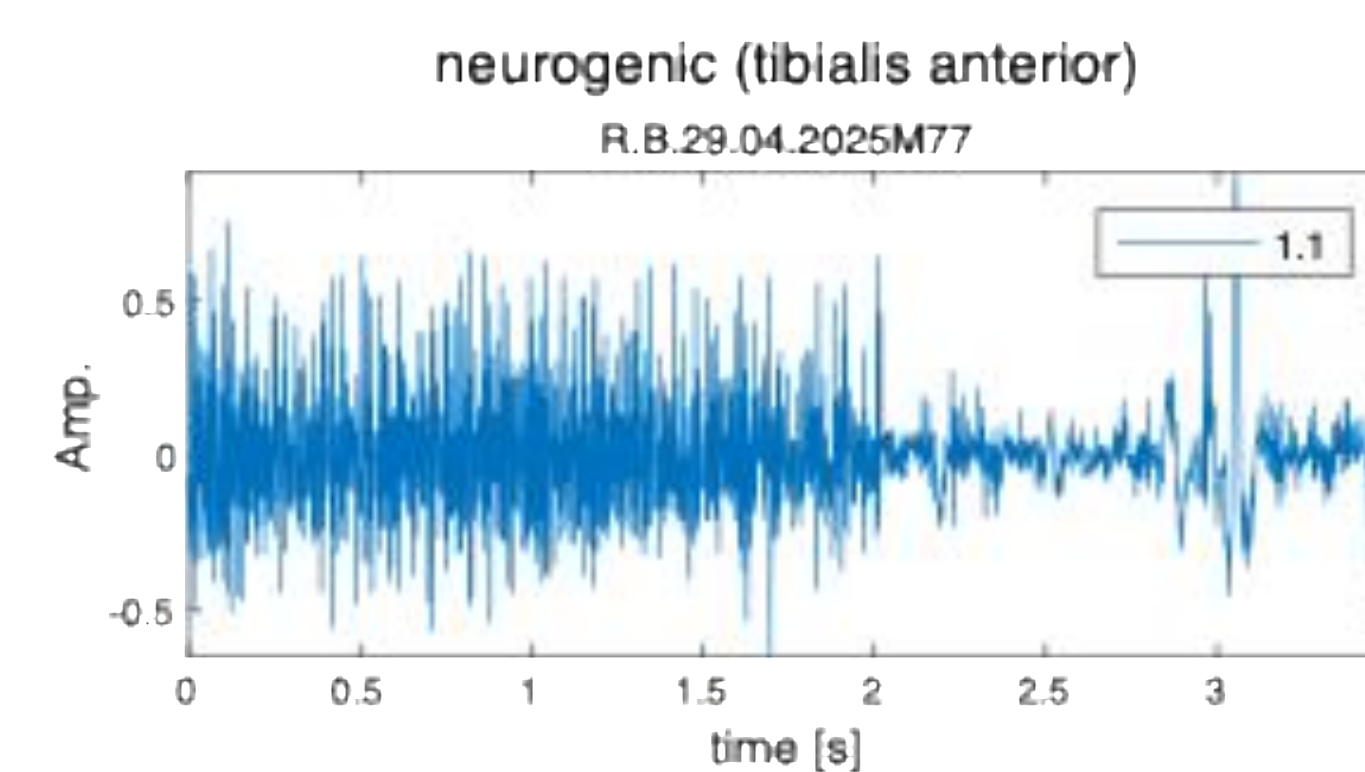
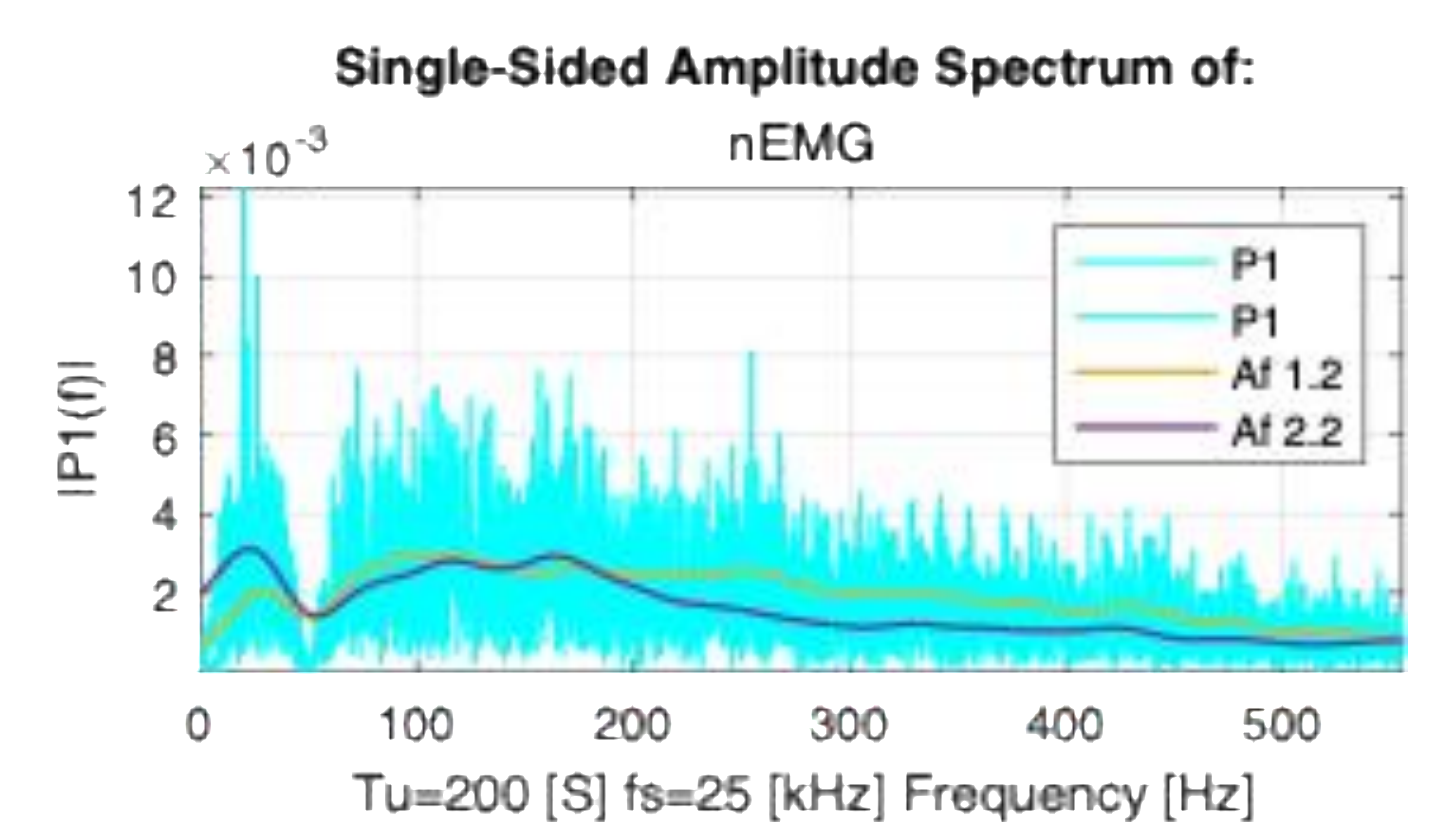
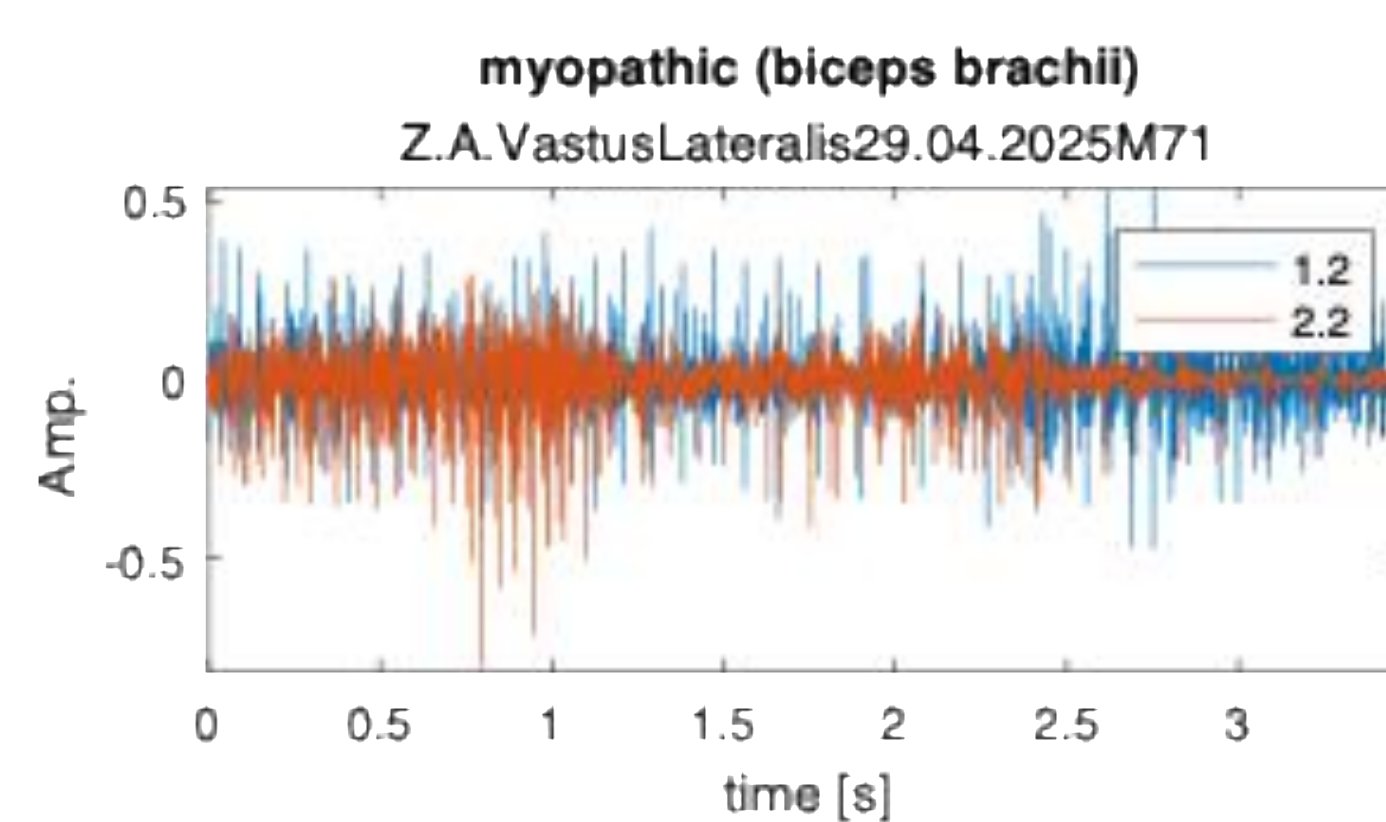
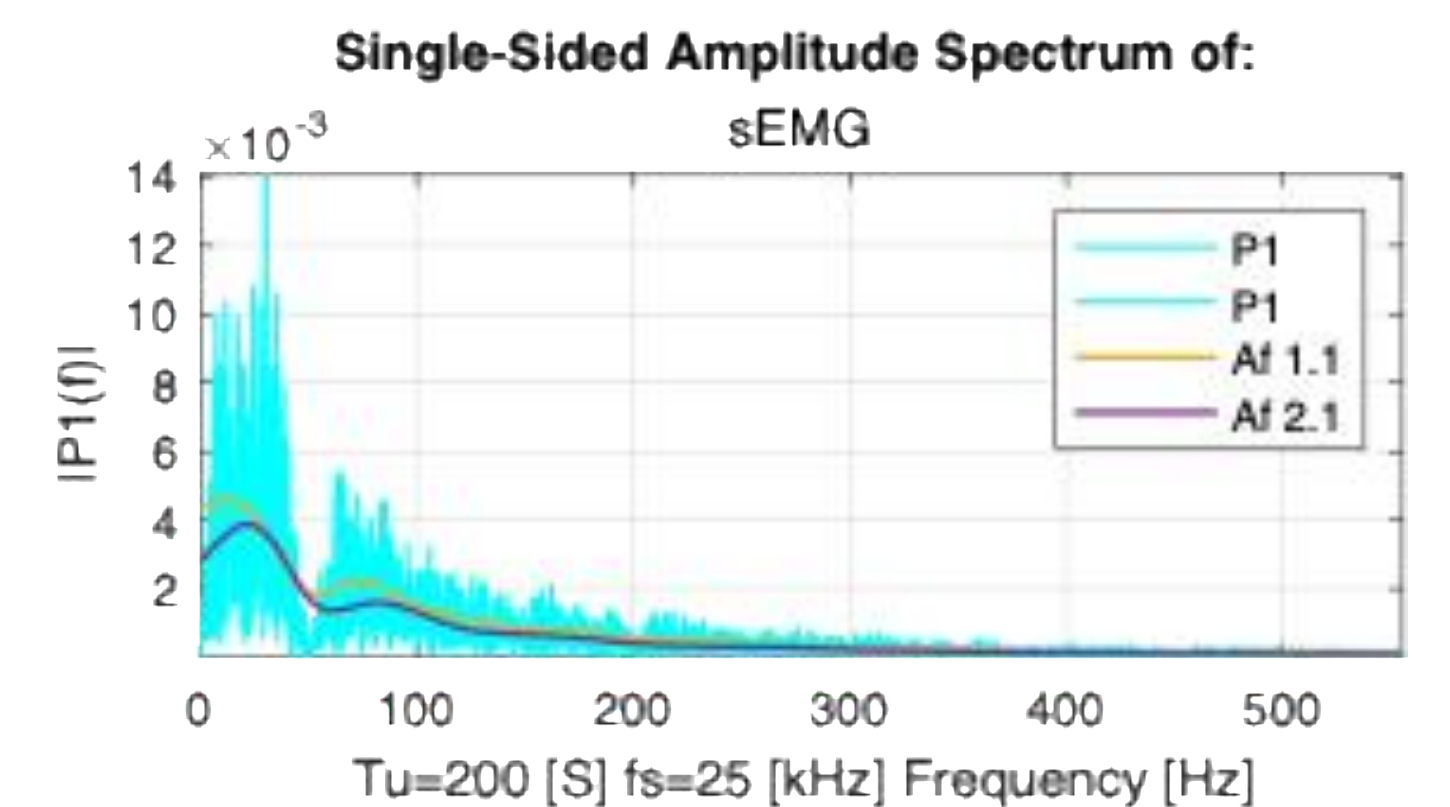
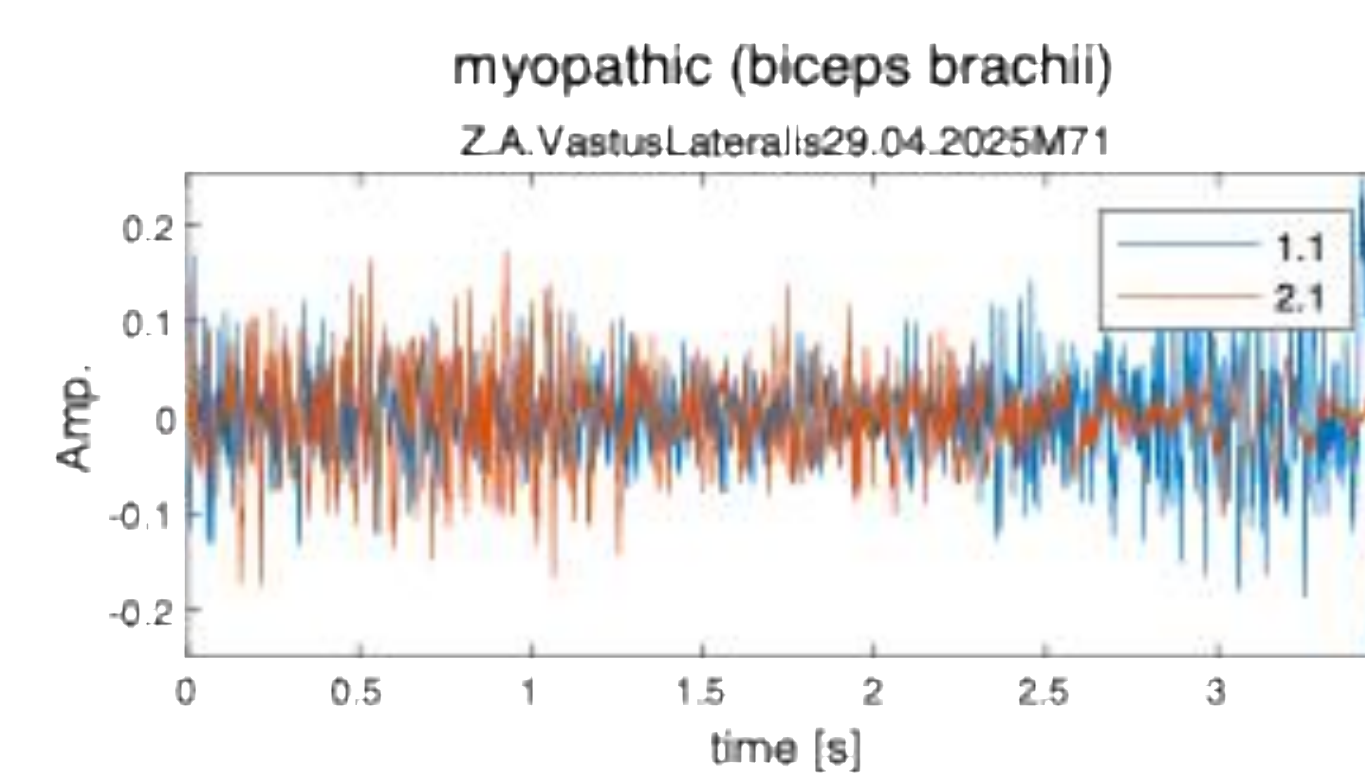
### Methods

nEMG recording were assessed visually by investigator blinded to sEMG recording.

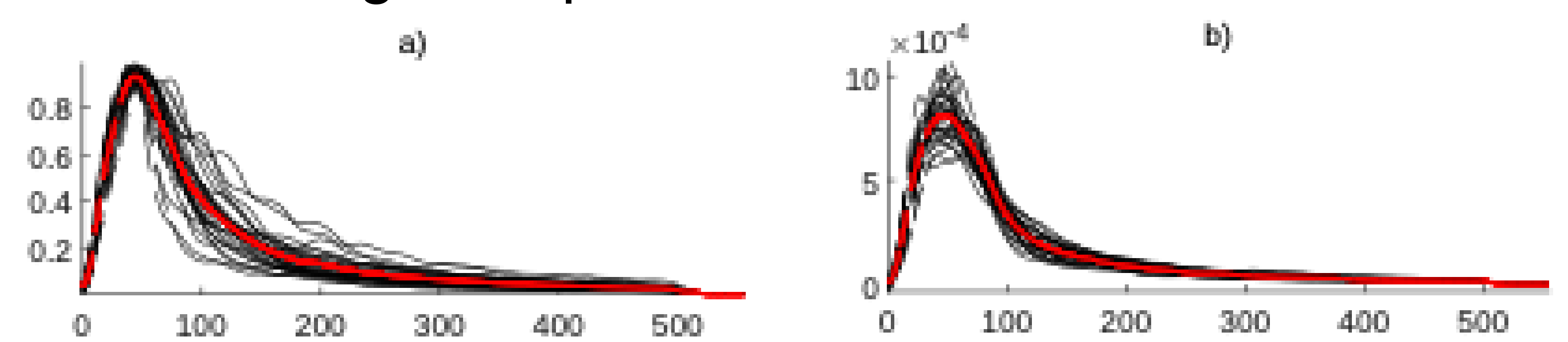


20 patients group are calculated, myopathic and neurogenic cases. Average age is 65 years old  $\pm$  12 years. sEMG signal was transformed using classification of averaged Fourier spectra (centroids) and the signal power distances and the Minkowski metric.

### Results



The transformed sEMG signal was different in all groups. It confirms discriminative properties of smoothed spectra, that means the method may be useful in diagnosis practice.



### Conclusion

These preliminary data showed differences of transformed sEMG in myopathic and neurogenic muscles and they warrant the future study on a bigger sample with analysis of sensitivity and specificity. Reliability of sEMG with investigated digital transformation may allow in the future to limit the painful and frequently troublesome nEMG.