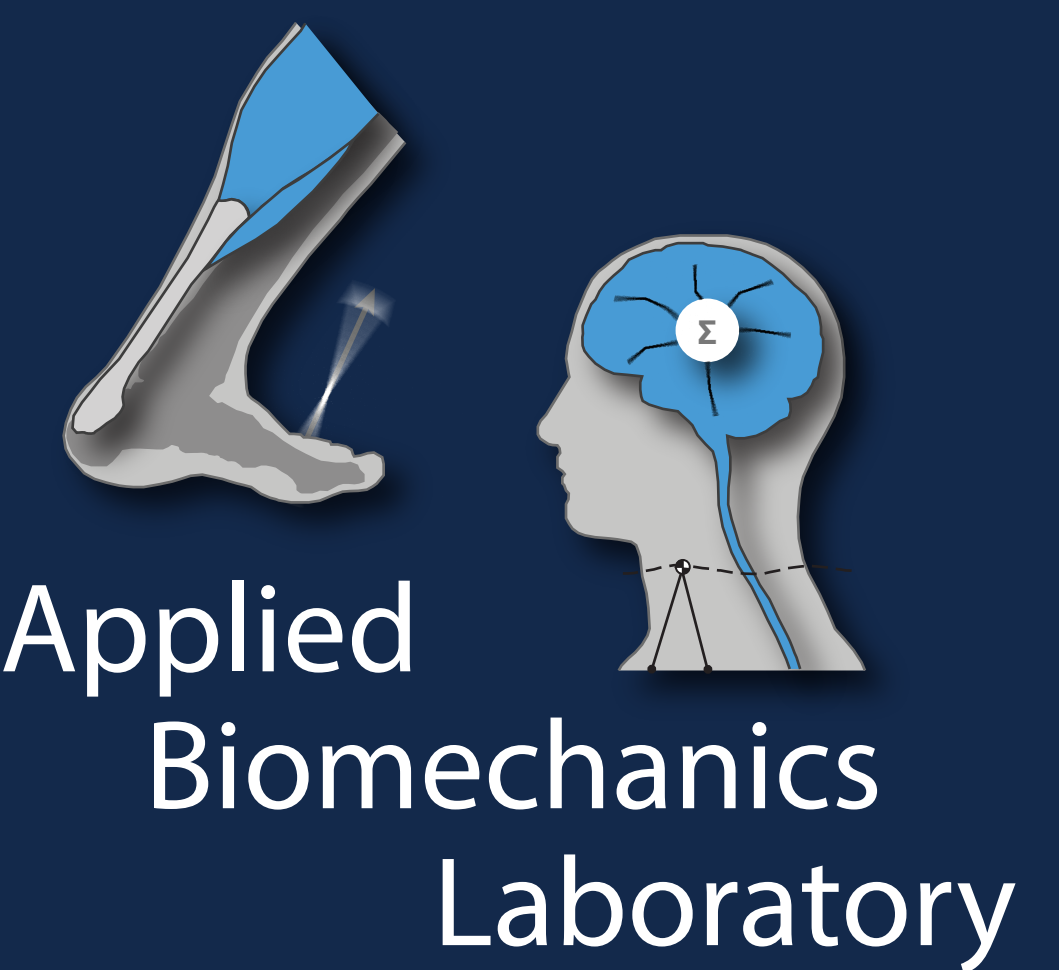


The Effects of Calf Muscle Length on Local Muscle Fatigability

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Introduction

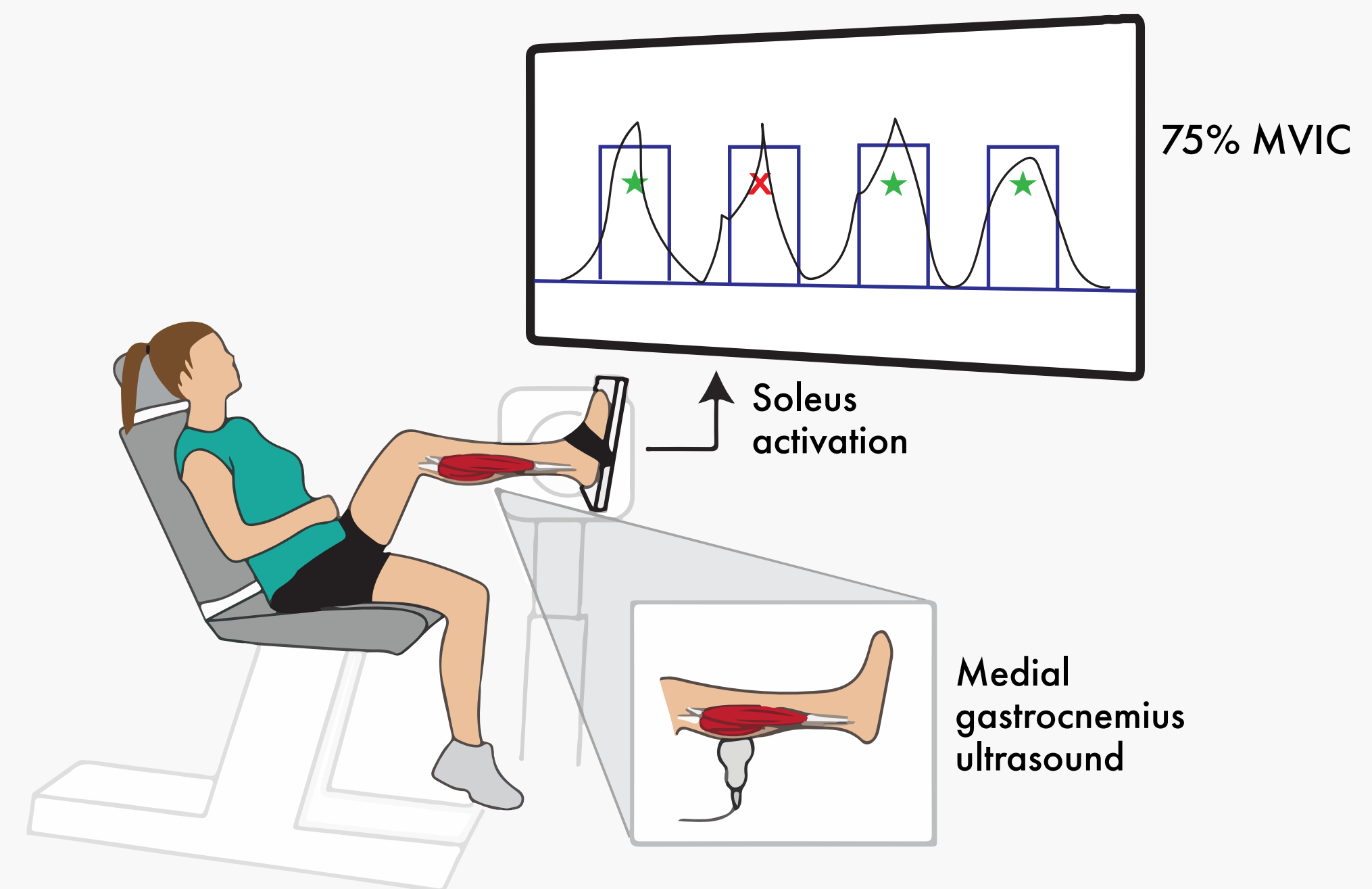
- Addressing walking disability in the aging population is a significant public health challenge.
- Older adults tend to operate their calf muscles at shorter lengths, which may lead to higher muscle activations and thereby earlier onset of fatigue during walking.

Purpose: Investigates the effect of calf muscle length on time to onset of fatigue

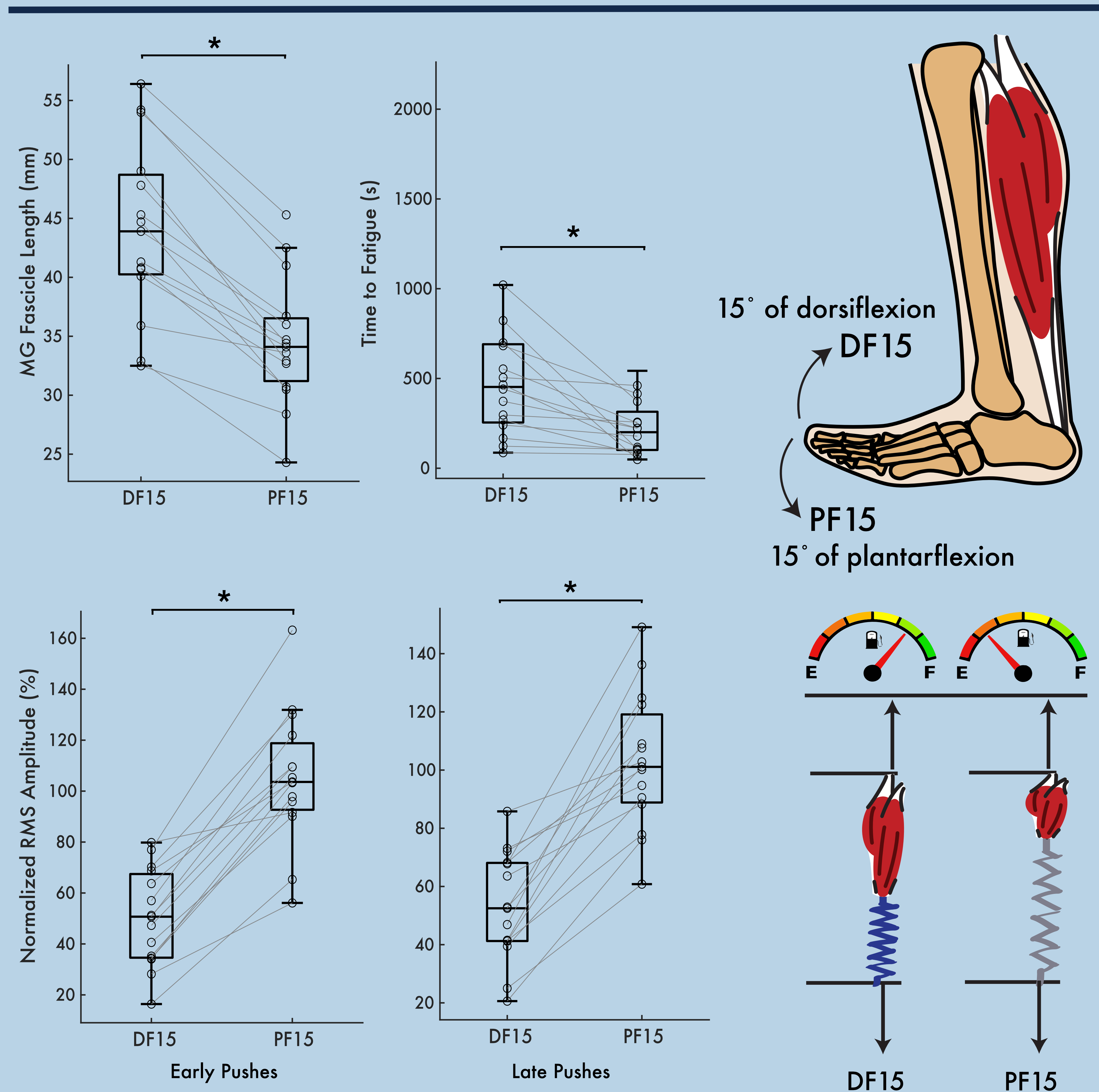
Hypothesis: Shorter calf muscle lengths will increase muscle activity and reduce time to onset of fatigue during fixed-end contractions to failure.

Methods

- 16 healthy younger adults (22.7 ± 4.5 years, 10M/6F, 76.0 ± 13.1 kg, 1.7 ± 0.1m)
- Two ankle postures result in muscle length difference.
 - Measured MVIC to set force target threshold (75%) and normalize.
 - Measured medial gastrocnemius (MG) fascicle lengths, soleus electromyography, and fatigue onset time.



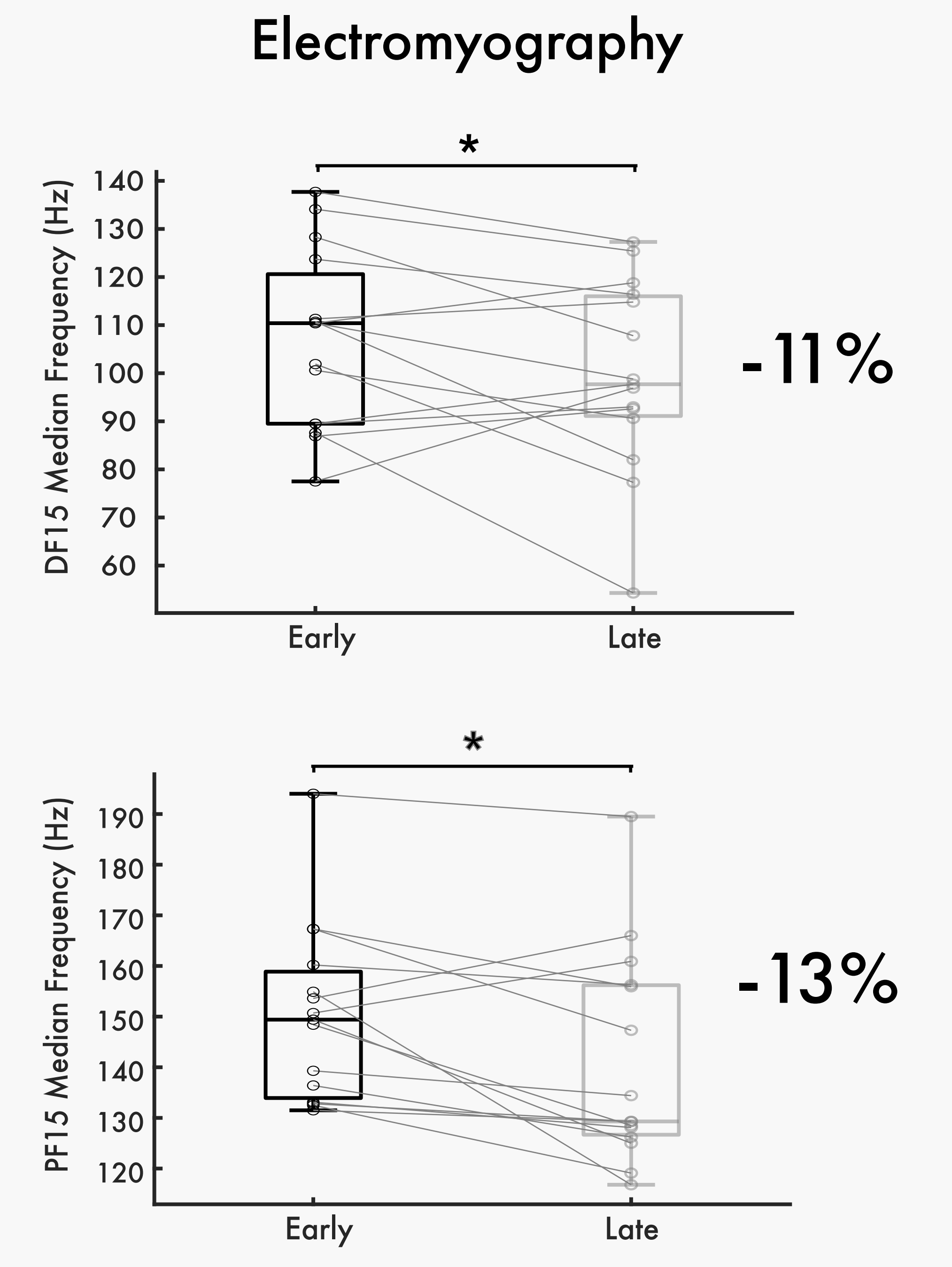
Fascicle lengths were significantly **shorter** at PF15, requiring **higher EMG activation levels** and **60% earlier time to fatigue**



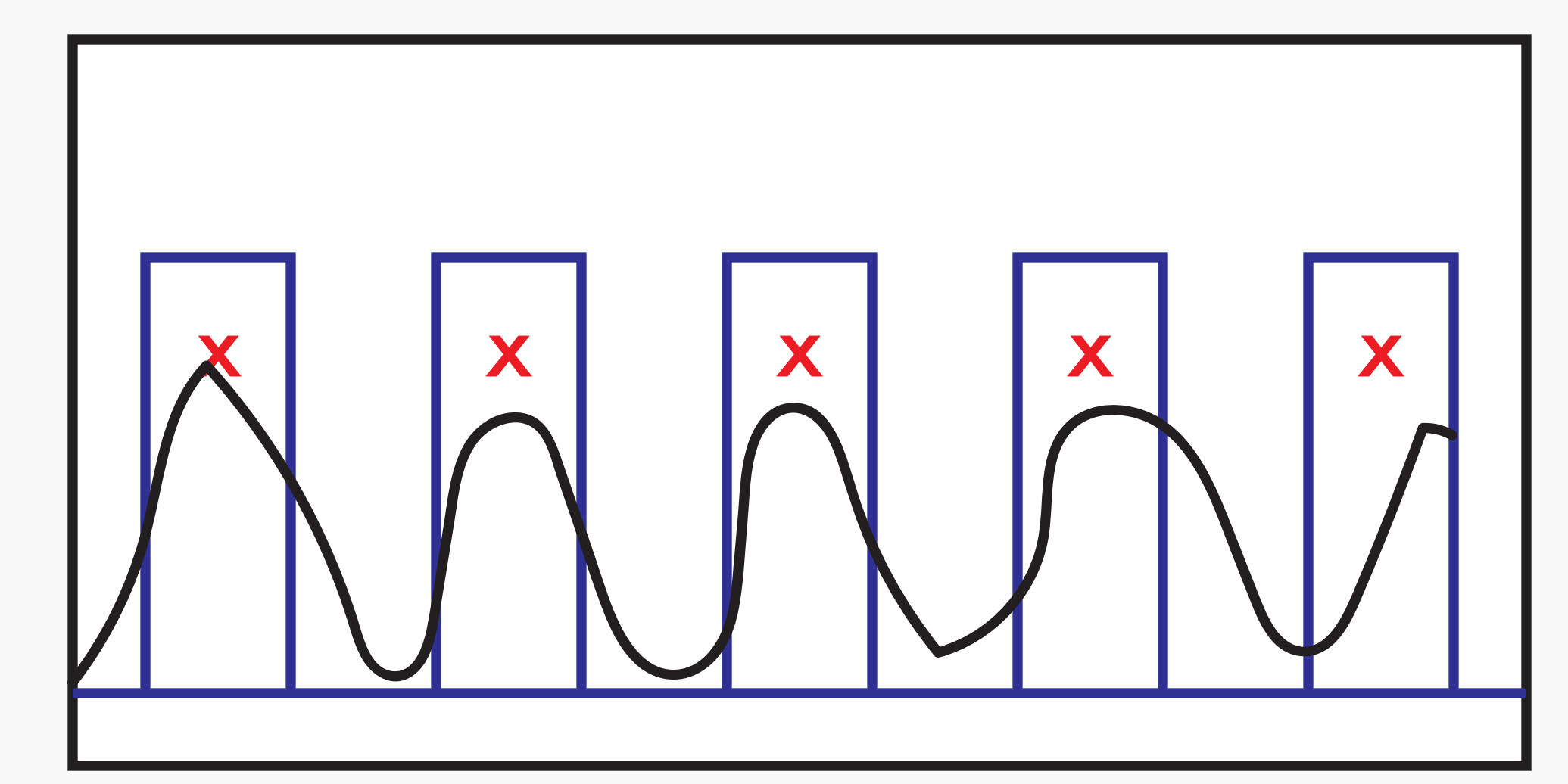
Key Takeaways

- Findings underscore the increased physiological demand on calf muscles at shorter lengths, relevant to mobility impairments in older adults.
- Results could guide personalized rehabilitation and training protocols, and the development of assistive devices to mitigate fatigue.

Determinants of Fatigue



Five consecutive pushes below threshold



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