Do reactions to balance perturbations improve with Fast muscle Activation and Stepping Training (FAST) in subacute stroke?

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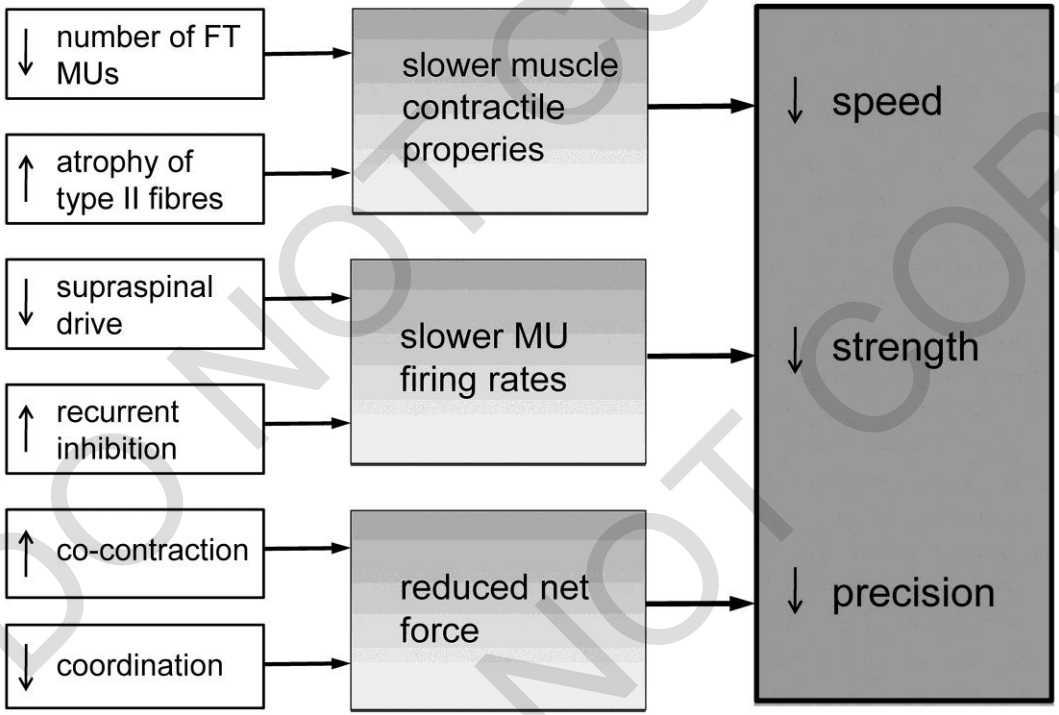
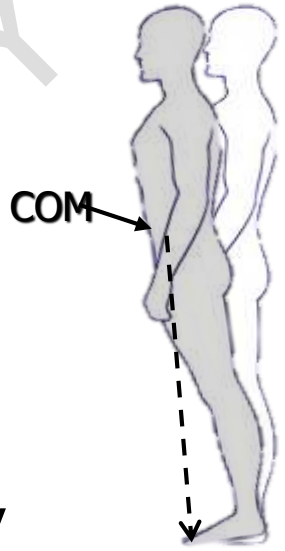
First International Motor Impairment Conference

Motor Control Impairments after Stroke



Why focus on speed?

- Falls occurrence is as high as 73% of community dwelling individuals post-stroke
- Stepping reactions are often the first line of defense to prevent falls
- Ability to produce protective stepping reactions requires speed of movement
- Muscle power is a predictor of functional mobility and balance in older adults



Purpose

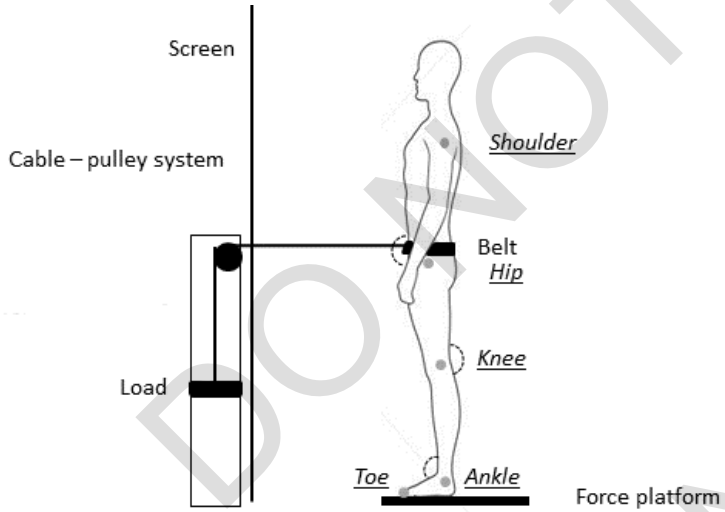
- To determine whether a program of Fast muscle Activation and Stepping Training (FAST) would evoke changes in muscle activation patterns and improved stability in response to external perturbations

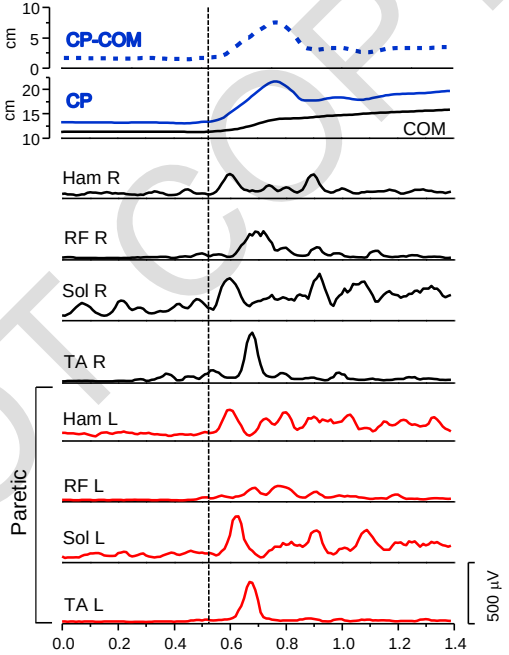
Intervention Protocol

- 12 sessions of outpatient physiotherapy over 6 weeks
- FAST vs. usual care
- Primary Outcome: Community Balance and Mobility Scale
  - Unilateral stance, running, hopping

Methods

Secondary outcome:
EMG/biomechanics of external perturbations



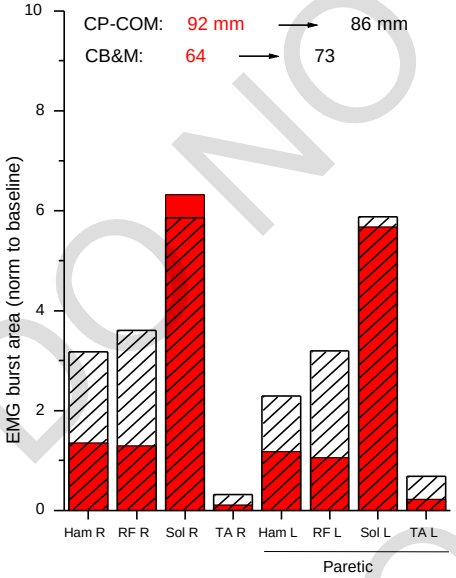


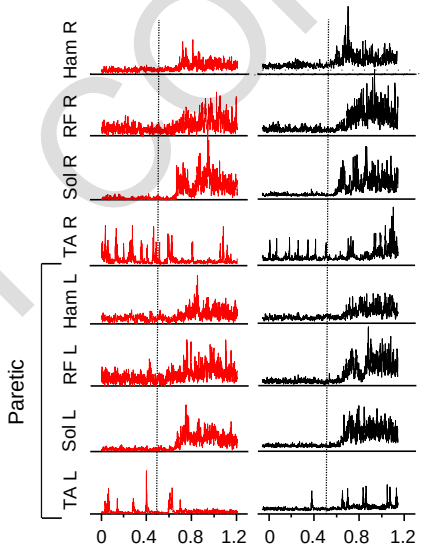
Single Participant Results

Reduction in CP-COM

Increase in CB&M score

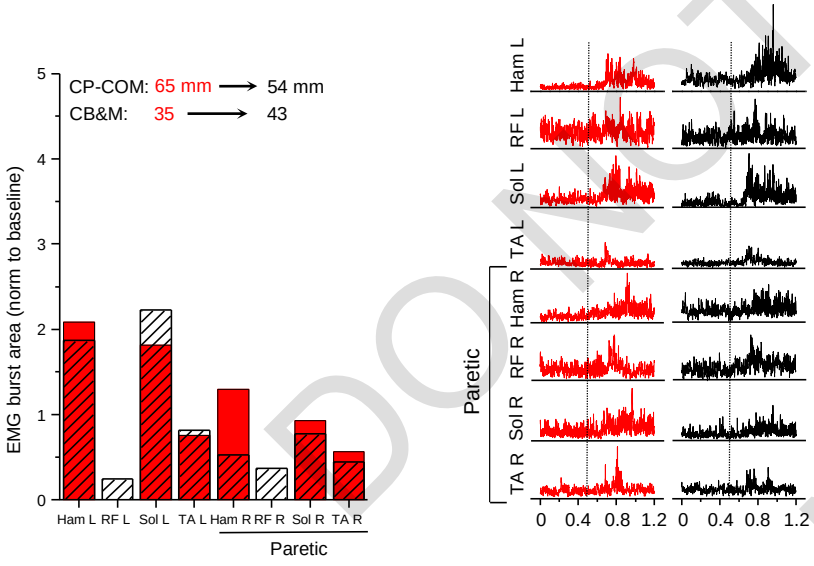
Increase in EMG following treatment

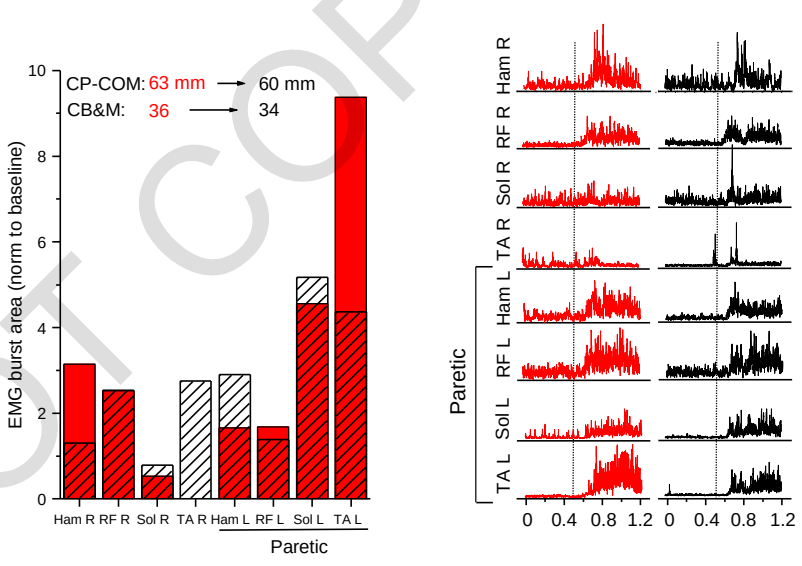




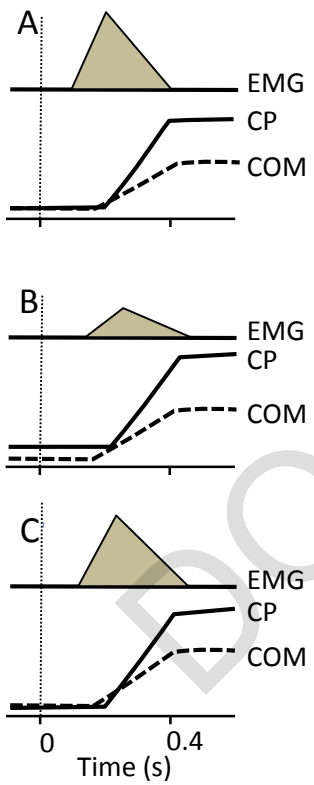
Contrary Results

Examples of two participants with similar CB&M scores at baseline
Left: improved CB&M and reduced CP-COM, little improvement in paretic EMG
Right: no improvement on CB&M, little change in CP-COM, increase in paretic EMG





Conclusions



Cartoon Summary:

A: Healthy

B: Stroke – lower EMG and larger CP excursion

C: Stroke recovery BUT improvement in biomechanical stability was not necessarily reflective of the EMG changes, as measured, that were highly variable across participants.