

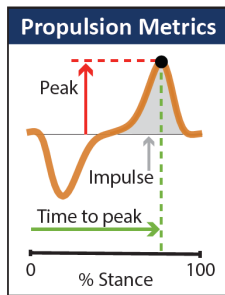
# Propulsion timing affects the relationship between paretic propulsion and long-distance walking function after stroke

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## Background

- The 6-minute walk test (6MWT) is a popular measure of post-stroke walking capacity.
- Post-stroke deficits in the paretic limb's generation of the **peak propulsion force** (i.e. the maximum anterior ground reaction force, A-GRF) and the **propulsion impulse** (i.e. the integral of the A-GRF) are associated with walking performance.<sup>1</sup>
- Post-stroke propulsion can be further understood by quantifying the **time of peak propulsion**, which may also influence walking performance.



## Objective & Hypothesis

To determine if the timing of the paretic propulsion peak influences 6MWT performance. We hypothesized that paretic propulsion peak timing would influence 6MWT performance above and beyond paretic propulsion magnitude metrics (i.e. peak and impulse).

## Methods

### Participants (N=34)

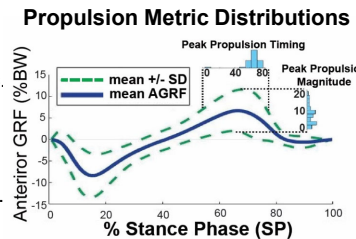
- > 6 mo post-stroke, 58.7±11.8 y/o, 59% male, and 65% left hemiparetic.

### Data Collection

- Total 6MWT distance
- Paretic A-GRF from 30 seconds of comfortable speed treadmill walking.

### Statistical Analyses

- Bivariate relationships between propulsion metrics and 6MWT distance.
- Two moderated regression models: **Model 1** included peak propulsion, peak propulsion timing, and their interaction. **Model 2** included propulsion impulse, peak propulsion timing, and their interaction.

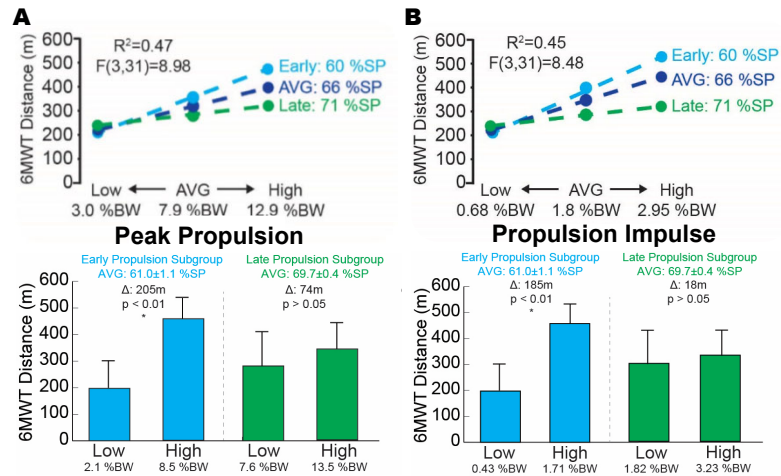
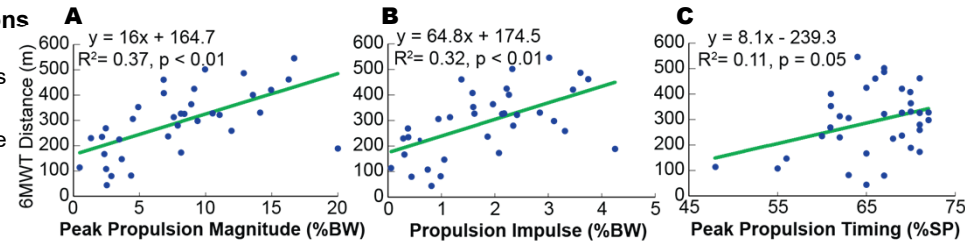


## Results

### 6MWT Bivariate Correlations

**Figure 1.** Bivariate correlations relating 6MWT distance to:

- (A) peak propulsion magnitude
- (B) propulsion impulse
- (C) peak propulsion timing



### Moderated Regression Models

**Figure 2.** The relationship between each propulsion magnitude metric — i.e. (A) peak propulsion and (B) propulsion impulse — and 6MWT distance was moderated by the timing of the propulsion peak such that:

- (i) Individuals with low propulsion magnitudes walked the shortest distances
- (ii) individuals with higher propulsion magnitudes and earlier peaks walked the farthest distances.

## Clinical Significance

Post-stroke individuals with **higher** paretic propulsion magnitudes and **earlier** peak propulsion timings walked the farthest distances during the 6MWT. Both magnitude and timing of paretic propulsion may need to be targeted during rehabilitation to maximize walking recovery.

## Acknowledgements

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**References:** [1] Awad, L., et al. 2015, *N.N.R.* doi:10.1177/1545968314554625