

Introduction

Background: Stroke is the third-leading cause of disability worldwide.¹ Improving post-stroke rehabilitation to restore functional mobility remains a topic of great interest.

Current Need:

- While previous studies indicate high-dosage and high-intensity therapy during stroke rehabilitation results in more favorable outcomes, the amount and structure of therapy vary widely between patients and institutions.^{2,3,4}
- Limited evidence on how therapy is tailored to individual needs and impairments to improve functional outcomes at discharge from inpatient rehabilitation facilities (IRFs).^{2,3,4}

Aim: To assess the relationship between **therapy characteristics** and **functional outcomes at discharge** from Inpatient Rehabilitation Facilities (IRFs) in patients with acute or subacute stroke.

Methods

Participants

Table 1. Demographics of the 22 Study Participants from Admission to Discharge

Characteristic	Study Population: Mean (SD, Range)
Age:	57.9 (12.6, 39-85)
Sex: female, n (%)	12 (54.5%)
Length of Stay (days):	21.1 (8.9, 10-56)
Days from Stroke to Admission:	9.8 (4.1, 2-18)
Paretic Side: Right, n (%)	11 (50%)
Type of Stroke	
Ischemic, Hemorrhagic, n (%)	15 (68.2%), 7 (31.8%)
Outcome Measure Scores (Adm, Dis)	
BBS	22.8 (15.9, 3-52), 34.7 (15.7, 7-53)
6MWT (m)	116.4 (104.9, 0-345.1), 198.62 (127.1, 23.9-411.1)
10MWT (m/s)	0.36 (0.30, 0-0.89), 0.59 (0.35, 0.07-1.07)

Abbreviations: SD, Standard Deviation; BBS, Berg Balance Scale; 6MWT, 6-Minute Walk Test; 10MWT, 10-Meter Walk Test (Self-Selected Velocity); m, meters; m/s, meters/second; Adm, Admission; Dis, Discharge

Therapy Characteristics and Outcome Measures

Table 2. Therapy Characteristics and Outcome Improvement Representations Investigated

Therapy Characteristics	Outcome Measures
Total Walking Distance (m)	10MWT Improvements at Discharge (m/s)
Time in Treadmill Intervention (min)	10MWT Improvements Absolute Value at Discharge (m/s)
Max Speed in Treadmill Intervention (mph)	10MWT Improvement Percentage at Discharge (%)
Total Session Number	6MWT at Discharge (m)
Total Number of Stairs Ambulated	6MWT Improvements at Discharge (m)
Walking Distance per Session (m)	6MWT Improvement Percentages at Discharge (%)
Time in Treadmill Intervention per Session (min)	BBS at Discharge (Out of 56)
Number of Stairs Ambulated per Session	BBS Improvements at Discharge
Walking Distance per Hospitalization Days (m/days)	
Time in Treadmill Intervention per Hospitalization Days	
Number of Stairs Ambulated per Days	

Abbreviations: m, meters; min, minutes; mph, miles per hour; m/day, meters per day; 10MWT, 10-Meter Walk Test (Self-Selected Velocity); 6MWT, 6-Minute Walk Test; BBS, Berg Balance Scale

Results

- 17 of 88 therapy-outcome measure combinations** across all time frames satisfied the criteria of $R^2 > 0.4$ and $p < 0.05$.
- Maximum speed achieved during treadmill training** was most predictive of improvements in 10MWT ($R^2 = 0.542$) and BBS ($R^2 = 0.613$) scores at Dis within 15 days post-Adm, and 6MWT ($R^2 = 0.624$) at Dis within 7 days post-Adm.

Figure 1. Correlation Heatmap of All Pairwise Combinations of Therapy Characteristics and Outcome Measures Across Analysis Windows



Conclusions

Interpretations: Maximum treadmill speed was strongly associated with improvements in walking speed, endurance, and balance, and may serve as a proxy for **anticipatory dynamic balance**, which is a critical component for improvements in gait post-stroke.

Future Investigations:

- Inclusion of **larger sample sizes** to assess the reliability and validity of current results.
- Exploration of **specific cut-offs** for therapy characteristics that correlate with improvements in outcome measures at discharge.

Limitations

- Current findings are restricted by **the type of therapy** provided by SRALab.
- Different experiences among raters** (two PT students, and a practicing PT).
- Due to the **small sample size**, considerations for **minimally detectable change** or **minimum clinically important difference** were not included.

Figure 2. Scatterplot of BBS Result and Max Speed on Treadmill

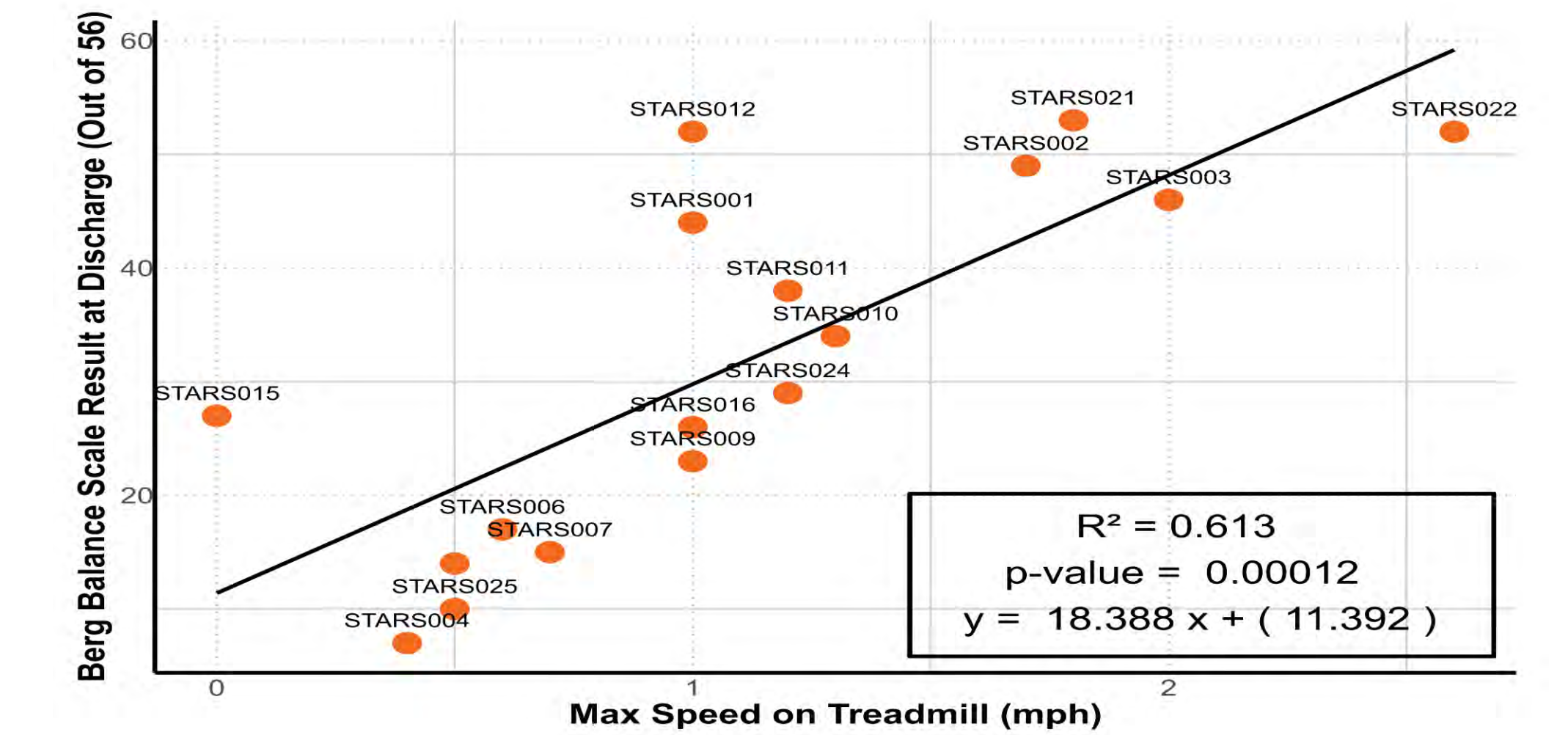


Figure 3. Scatterplot of 6MTW Result and Max Speed on Treadmill

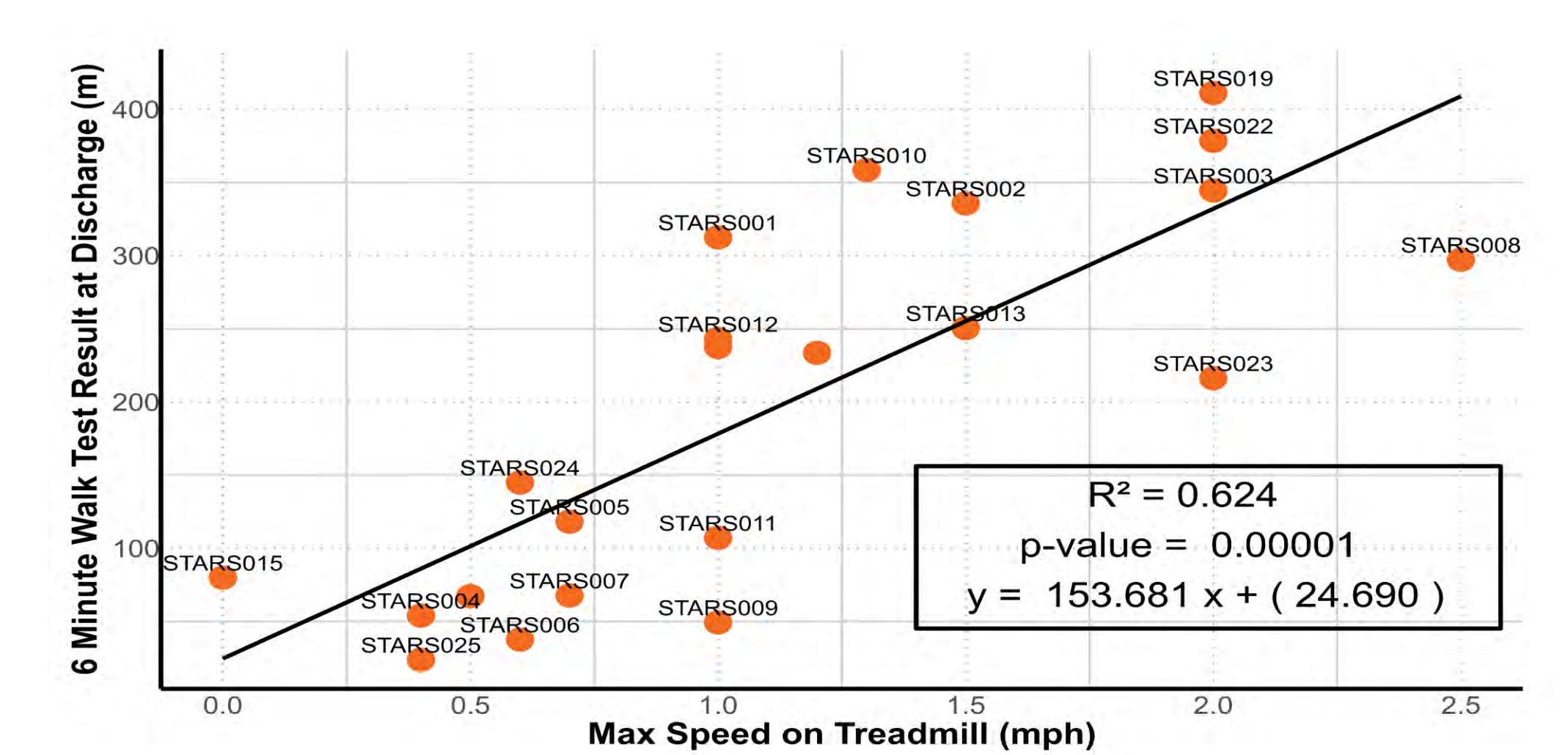
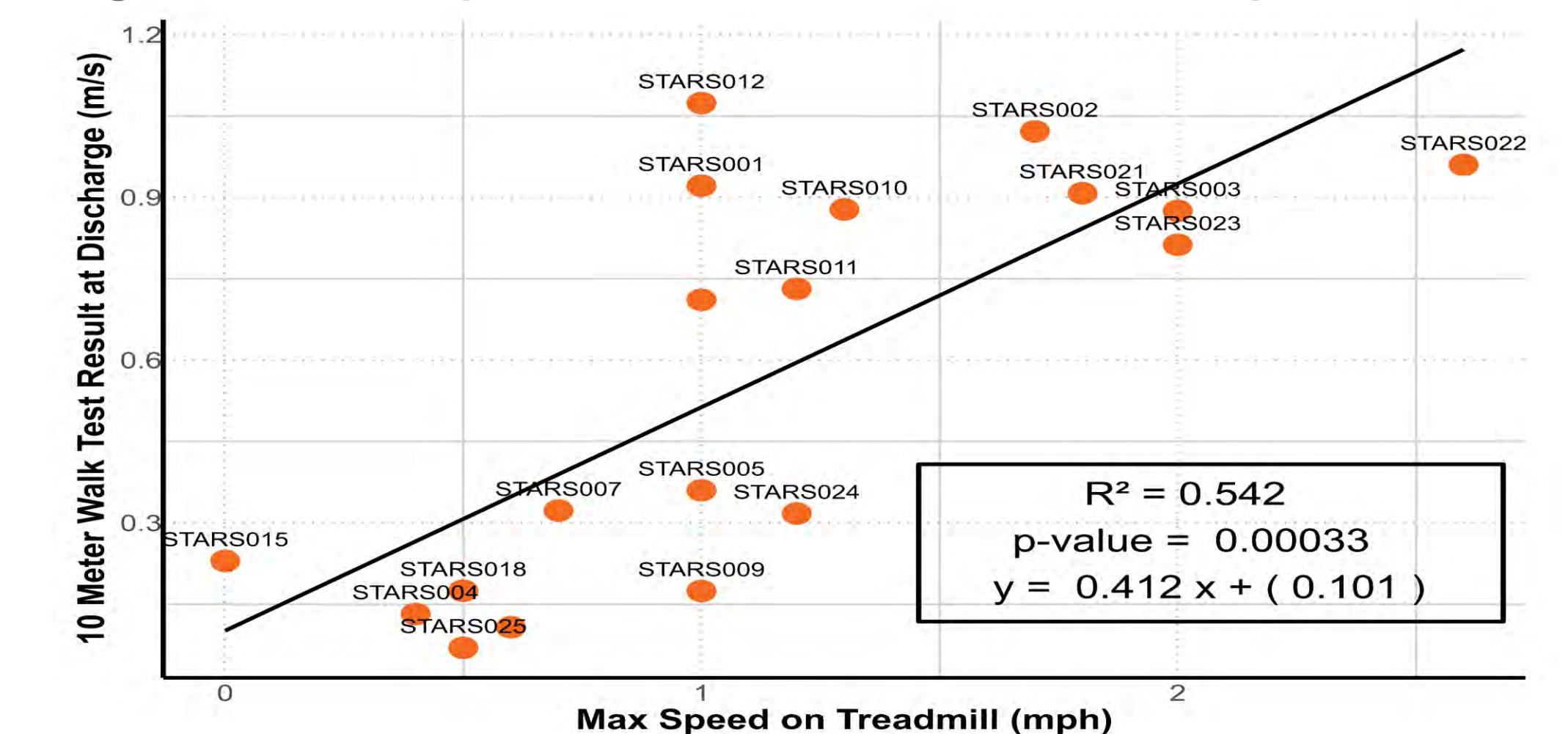


Figure 4. Scatterplot of 10MWT Result and Max Speed on Treadmill



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