

# Resistance Exercise During Post-Concussion Rehabilitation in NCAA Division I Athletes: A Preliminary Observational Study

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## Purpose

- To observe if resistance activity may lead to symptom exacerbation or prolonged recovery during post-concussion rehabilitation.

## Why Weightlifting in Concussion Recovery?

- Sub-symptom exercise is beneficial for concussion recovery
- Increases Brain-Derived Neurotrophic Factor and Insulin-like Growth Factor-1 which can improve neuroplasticity

## Methods

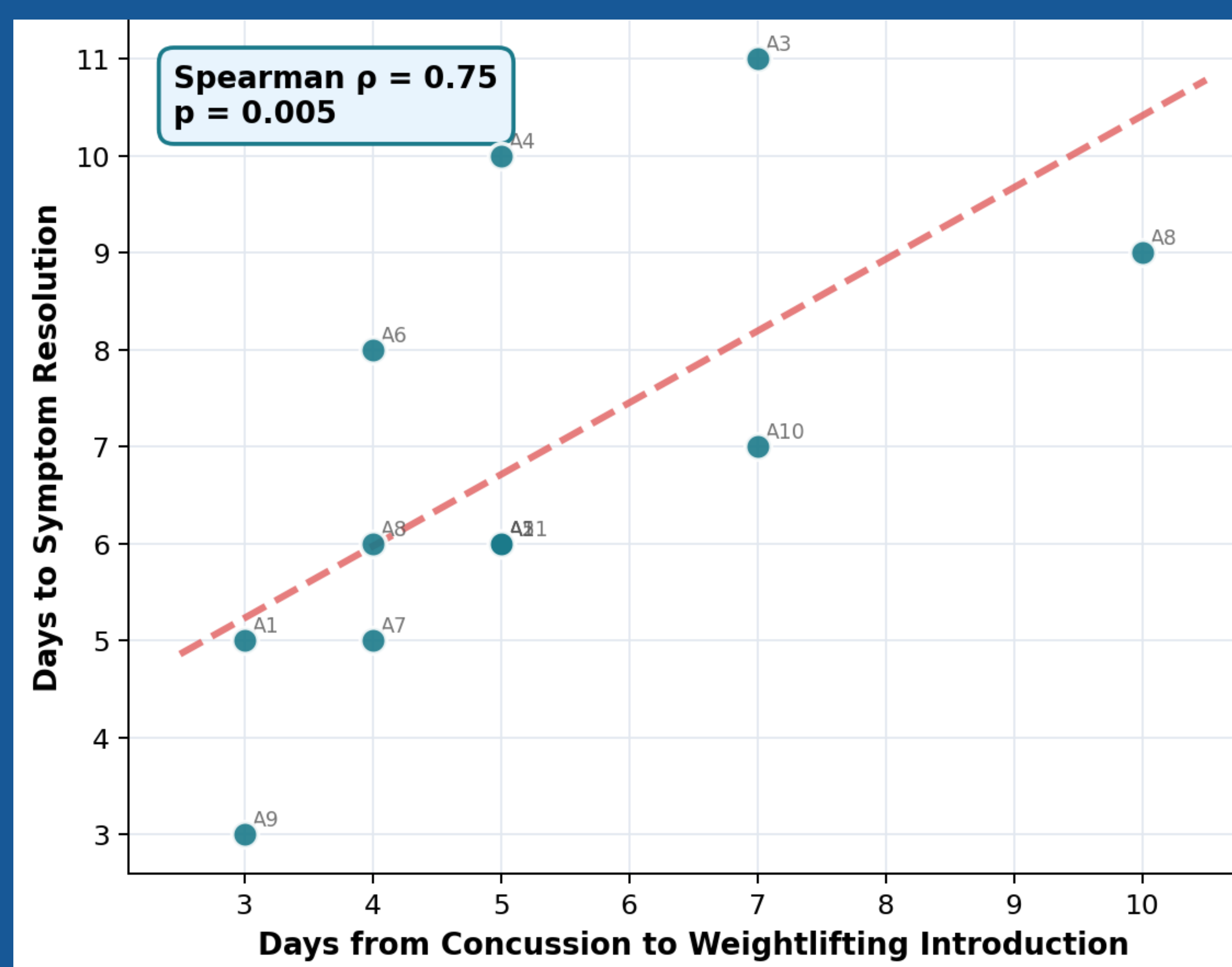
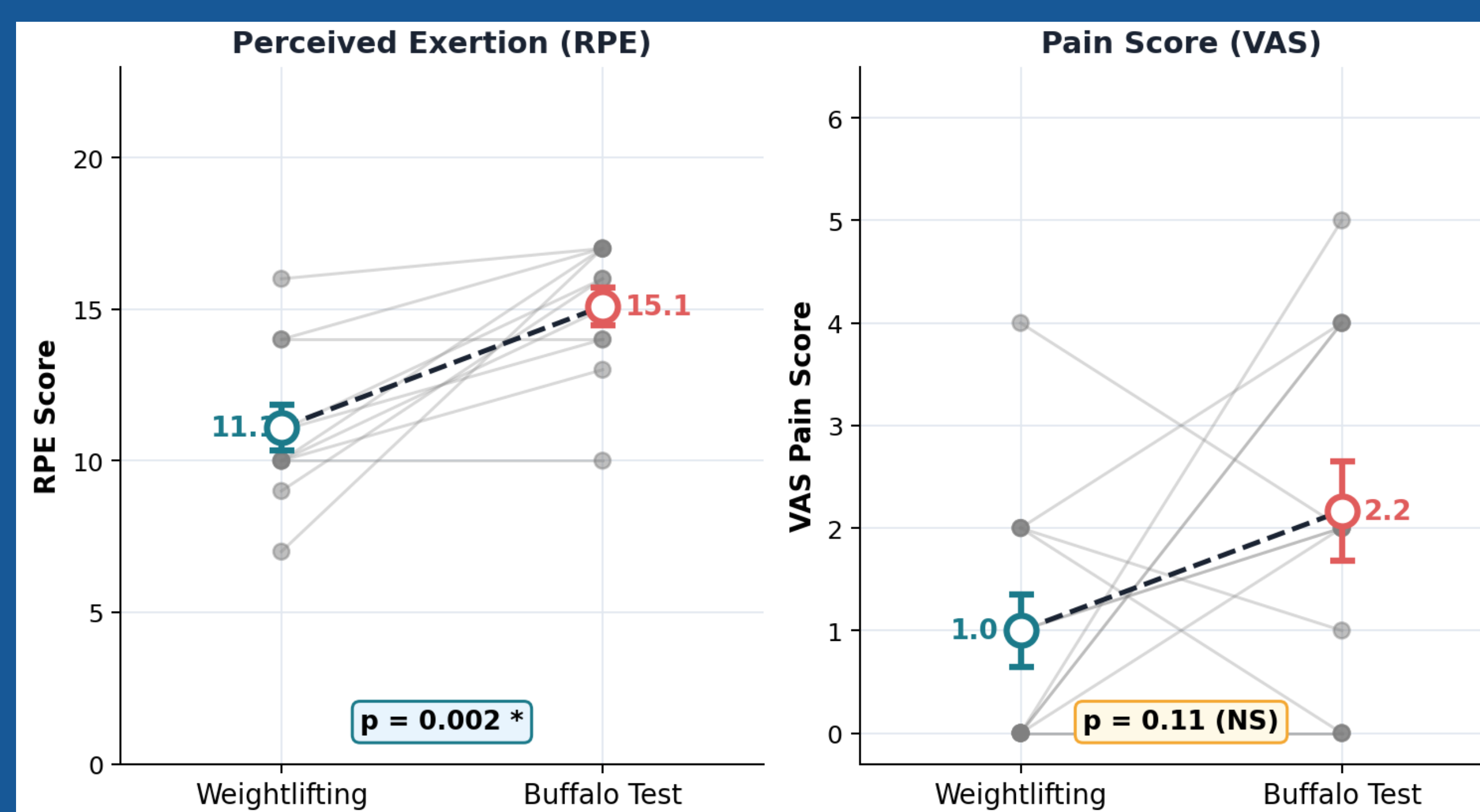
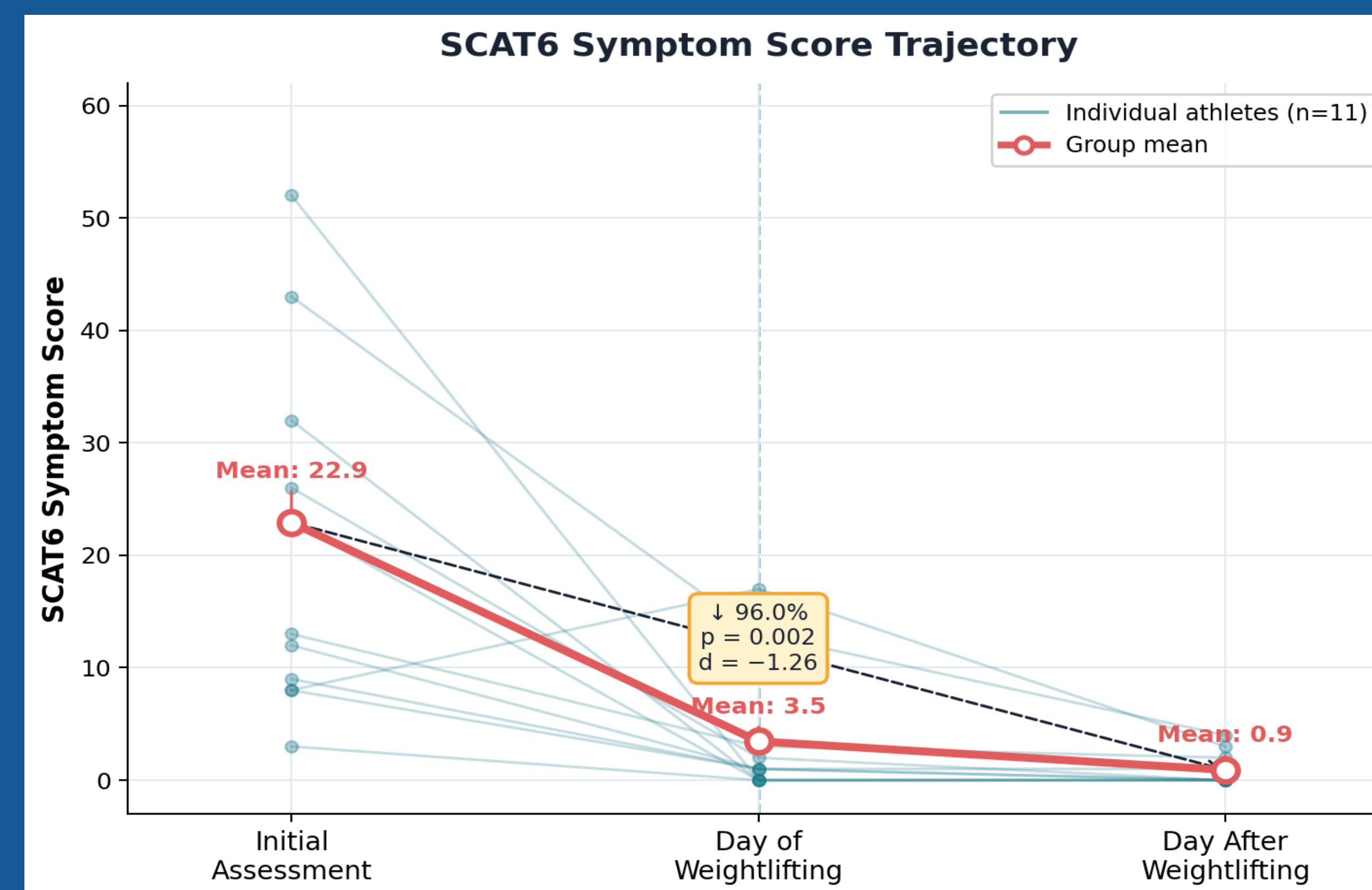
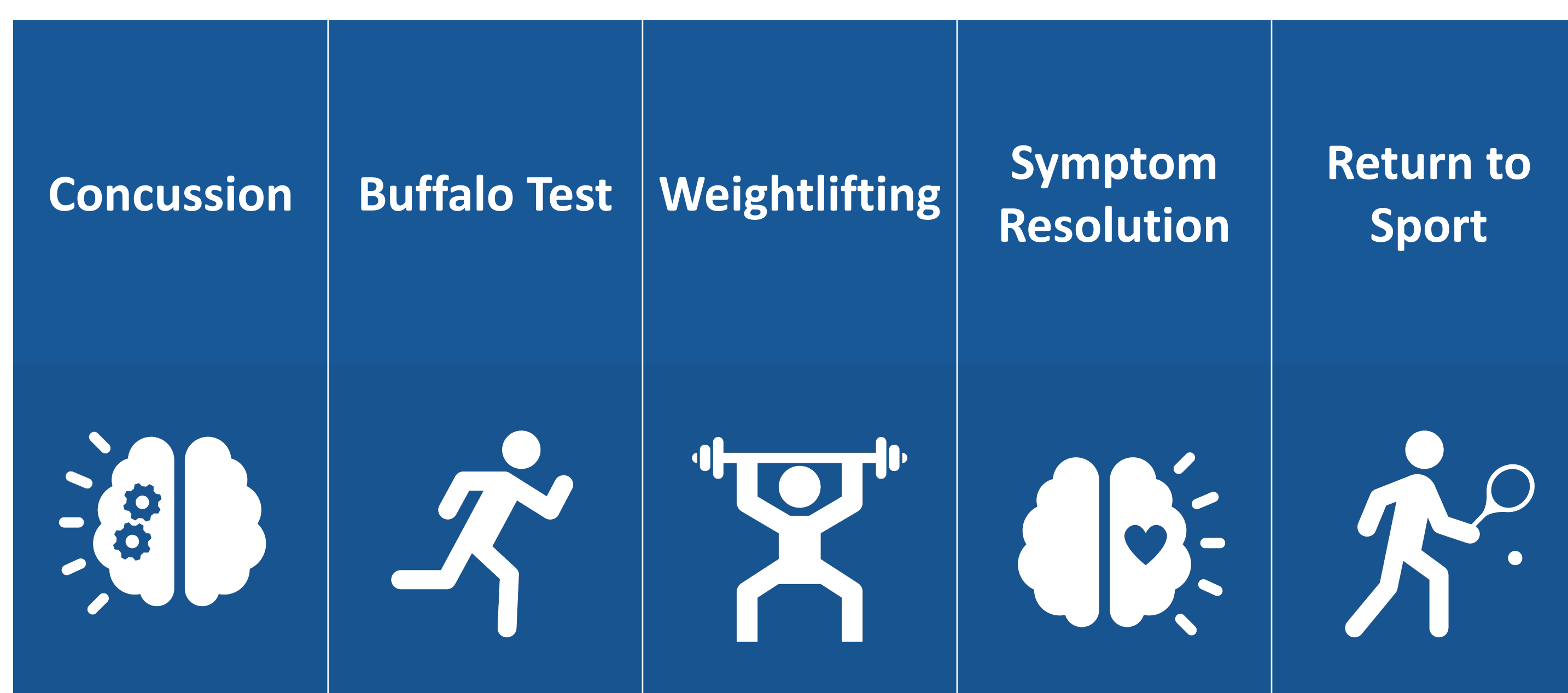
- Participants:** 11 NCAA Division I athletes
- Design:** Observational study
- Intervention:** Observing resistance activity effect on post-concussion recovery

## Measurements

- Sport Concussion Assessment Tool 6 (SCAT6) symptom score
- Visual Analog Scale (VAS)
- Rate of Perceived Exertion (RPE)

## Results

- Eleven athletes (8 females; mean age  $19.8 \pm 1.4$  years).
- Weightlifting (WL) occurred  $5.2 \pm 2.0$  days post-injury.**
- Average time to symptom resolution was  $6.5 \pm 2.4$  days, and return-to-sport time was  $10.3 \pm 3.4$  days,** within expected recovery timelines for sports-related concussion.
- No adverse events were reported.



## Analysis

- 0/11 athletes had worse SCAT6 scores after WL.**
- 55% of athletes' symptoms improved the day after WL, 45% of athletes' symptoms were unchanged (Wilcoxon  $p = 0.03$ ).
- Mean SCAT6 symptom scores decreased from 22.9 (initial) to 3.5 (day of WL) to 0.9 (day after WL).**
- 96% symptom score reduction from initial assessment to day after WL ( $p = 0.002$ , Cohen's  $d = -1.26$ ).
- WL had significantly lower RPE than the Buffalo Test (11.1 vs 15.1,  $p = 0.002$ ). VAS trended lower (1.0 vs 2.2) but was nonsignificant ( $p = 0.11$ ).
- Earlier WL introduction correlated with earlier symptom resolution (Spearman  $\rho = 0.75$ ,  $p = 0.005$ ).

## Significance

- This study provides **initial observations that resistance activity may be a safe addition to post-concussion rehabilitation.**
- These findings may support different post-concussion rehabilitation strategies.

## Conclusions

- Preliminary findings indicate that **post-concussion resistance activity was not associated with prolonged recovery or symptom exacerbation.**
- Large controlled studies are still needed to understand the effects of resistance exercise in post-concussion recovery.

## Limitations

- Small sample size
- Resistance training variability
- Lack of a control group
- Participant selection bias, confounding variables

## Acknowledgements

- UCLA Sports Medicine Division
- Participating NCAA Division I athletes

## References

