

Associations of Objective Fitness, Subjective Function, and Vascular Health with NIH Toolbox Fluid Cognition in Older Adults: The ACE Trial

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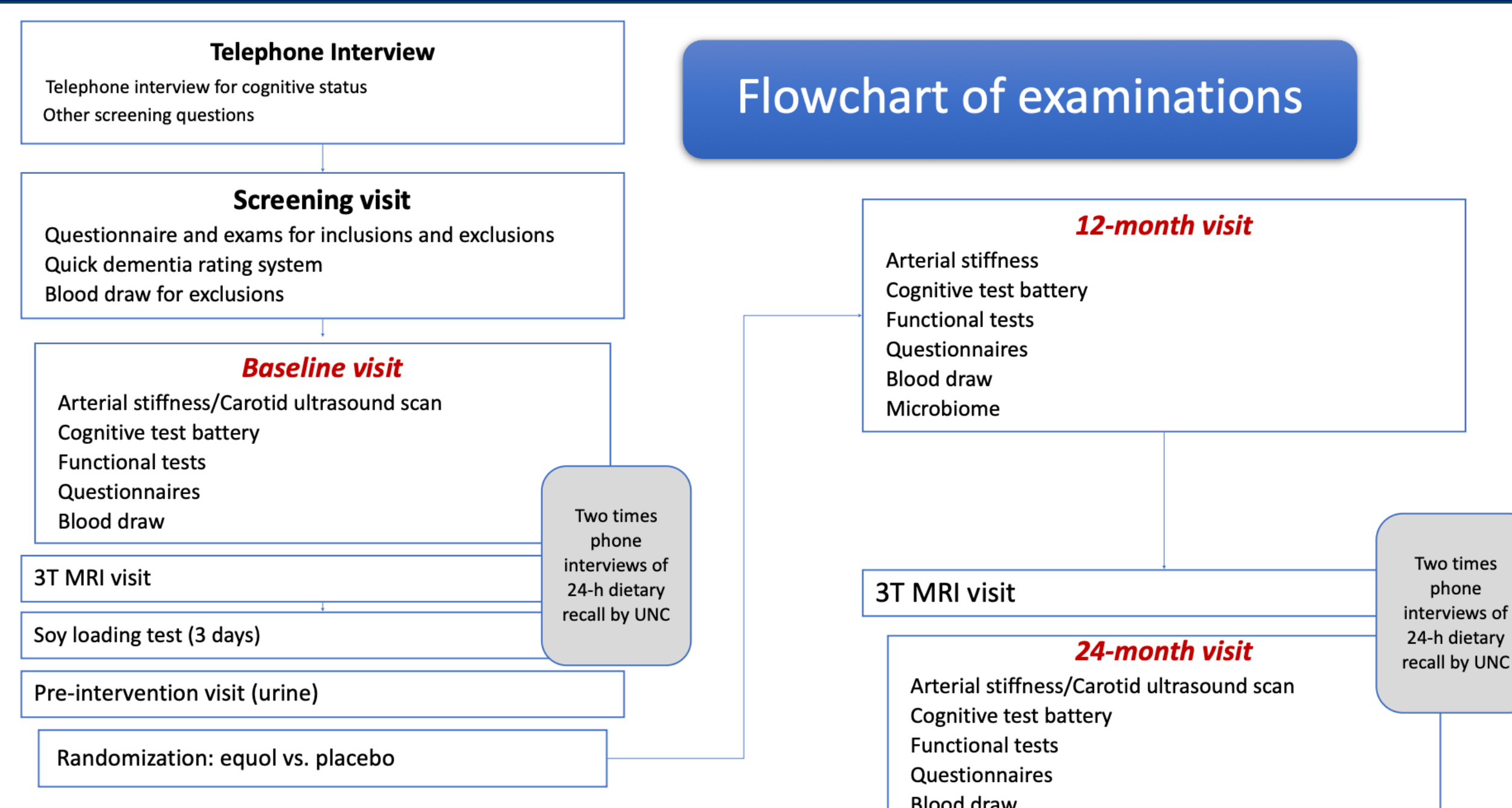
Higher systolic blood pressure predicted worse fluid cognition in older adults. Physical fitness and function measures showed no association. Vascular health may be a stronger cognitive indicator than fitness in later life.

Background

- Current validated markers of cognitive decline, such as CSF & blood biomarkers and brain imaging, are costly, invasive, or difficult to routinely obtain.
- Simple physical assessments such as gait speed and grip strength have been shown to predict incident dementia over time.
- Perceived fatigability predicts mobility decline and may identify cognitive impairment.
- Vascular health is similarly measurable and is linked to cognitive decline, but comparisons across these domains remain limited.
- Understanding which measures track with cognition could inform screening in clinical and community settings.



Methods



Demographics

Characteristic (n = 369)	Mean ± SD
Age (years)	72.1
Female	191 (52%)
African American	79 (21%)
Fluid Cognition (T-score)	52.7 (9.9)
Gait Speed (m/s)	1.2 (0.2)
Grip Strength (kg)	29.3 (9.5)
BMI (kg/m ²)	27.8 (4.7)
Systolic BP (mmHg)	131.0 (16.1)
MAP (mmHg)	93.5 (10.4)
Pulse Rate (bpm)	63.9 (9.7)

Purpose

- The multisite randomized controlled ACE Trial is testing whether S-equol, a soy isoflavone metabolite, improves vascular and cognitive health in older adults over a 2-year period, across Emory University, the University of Pittsburgh, and Wake Forest University.



Equol Arm: 10mg/day (2 pills x 2 daily)

Placebo Arm: matched pills and schedule

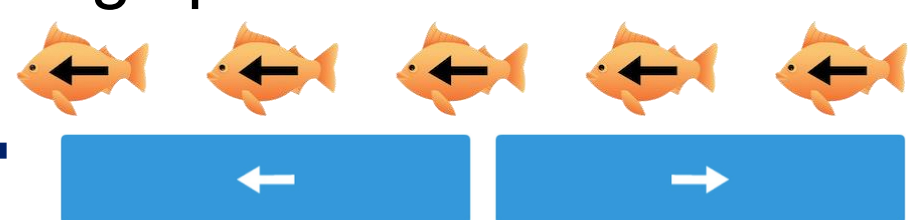
Randomized 1:1, double-blind

- This poster presents an ancillary cross-sectional analysis of ACE baseline data, before the start of the intervention, examining whether **objective fitness, subjective function, or vascular health measures** are most strongly associated with cognitive scores.

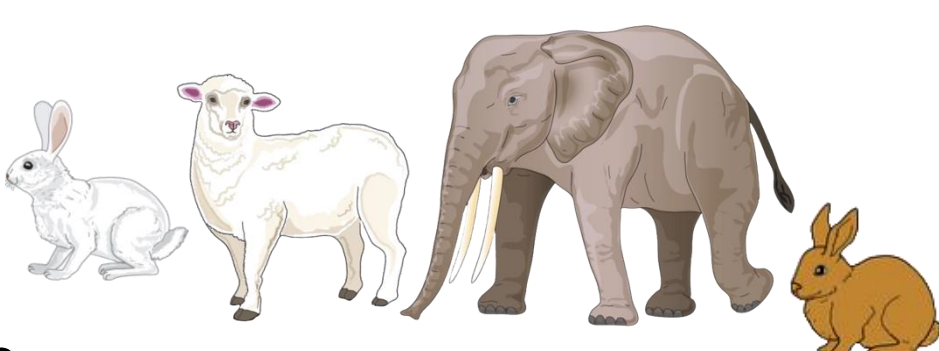
Cognitive Assessment

- Fluid: reasoning and processing speed in *novel* tasks

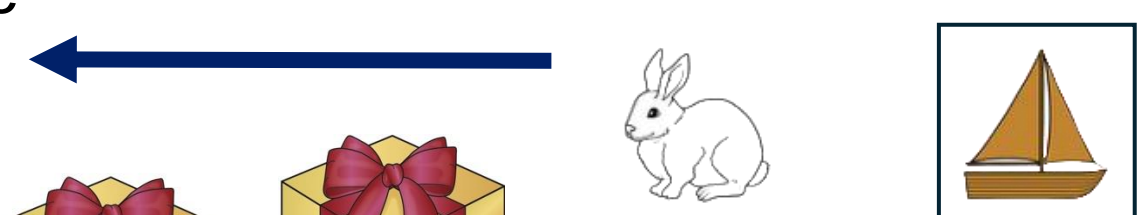
Flanker Inhibitory Control and Attention Test



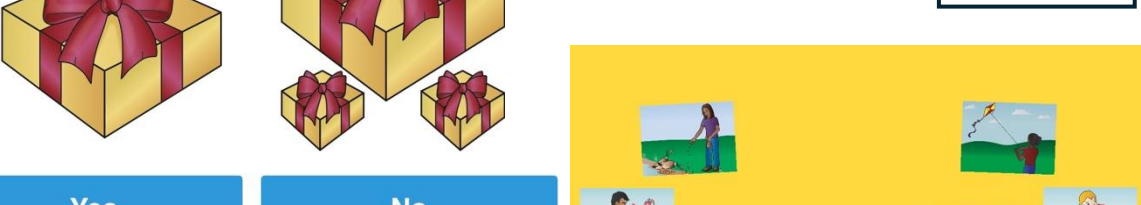
List Sorting Working Memory Test



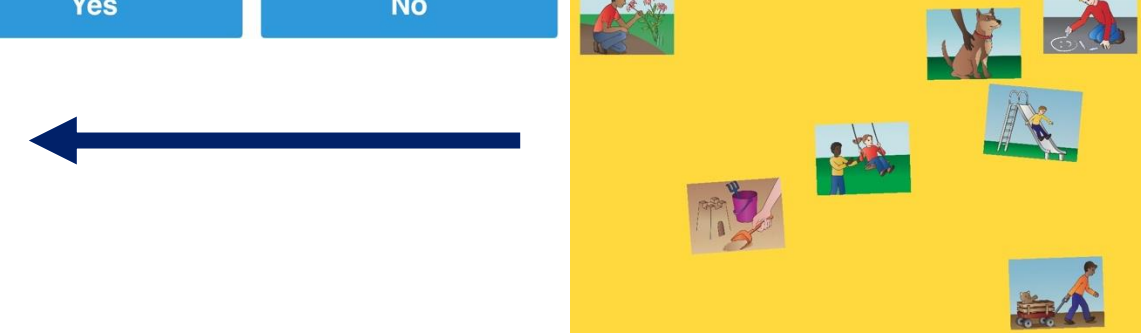
Dimensional Change Card Sort Test



Pattern Comparison Processing Speed Test



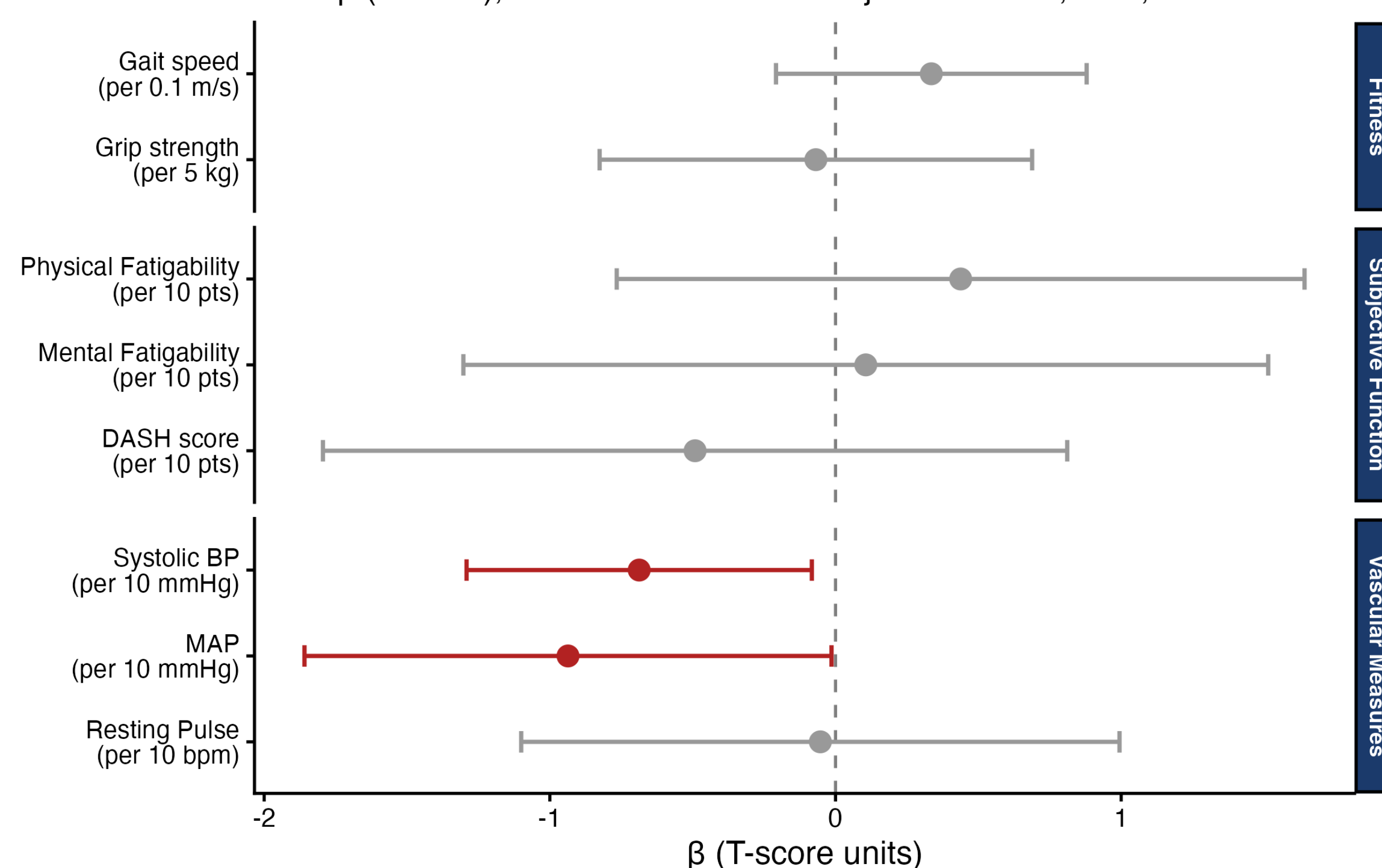
Picture Sequence Memory Test



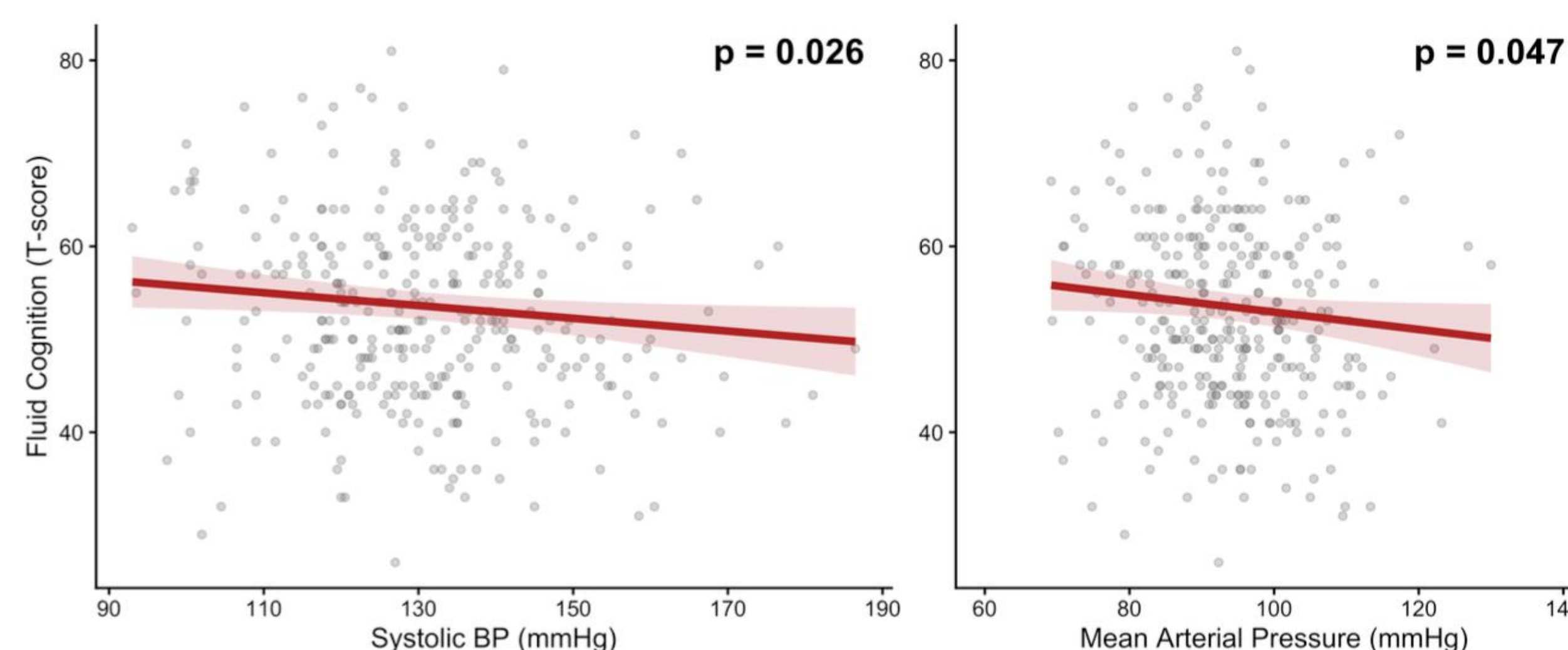
Results

Associations with NIH Toolbox Fluid Cognition

β (95% CI), mixed-effects models adjusted for sex, race, and site



Vascular Measures vs. NIH Toolbox Fluid Cognition



Conclusion

- Systolic blood pressure and mean arterial pressure were significantly associated with fluid cognition.
- In this cohort, vascular health may better reflect current cognitive performance than physical fitness.
- As the ACE Trial wraps up data collection, we will examine these variables across time points to expand this baseline analysis.
- Within-person change in grip, gait, and related measures over time may be more informative than baseline level, since some individuals are naturally stronger or faster, and rate of decline could track cognition better than a single snapshot.

Impact

- Findings support the addition of blood pressure screening to cognitive risk assessment in clinical and community settings.

Acknowledgements

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