

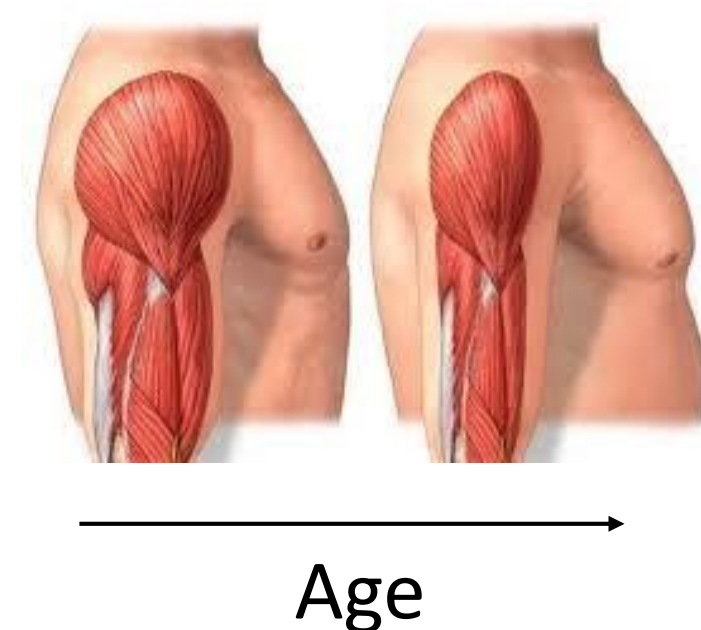
Prevention and Management of Sarcopenia: Latest Research Evidence

Brittany Cory, Department of Health Sciences.
Carroll College, Helena, Montana.

Background

Sarcopenia: age-related loss of skeletal muscle mass and strength

- Mass declines 1-2% per year
- Strength declines 3% per year after age 60



Prevalence

- 1-29% community dwelling populations
- 14-33% long-term care residents

Impact

- Functional impairment
- Poor health-related quality of life
- Fall risk
- Premature death

Costs

- CDC reported in 2015, medical costs for falls totaled more than \$50 billion
- Average hospital cost for a fall injury is over \$30,000

Interventions

Diet

- Beta-Alanine Supplementation

Exercise

- Resistance Training

Combination

- Whey protein & resistance training

Diet

Beta-Alanine Supplementation

Journal of the International Society of Sports Nutrition (2018)

Question: Effects of increased carnosine stores via beta-alanine supplementation and how it effects exercise capacity and executive function

Methods

- 12 adults (average age=60.5±8.6 yrs.)
- 2.4g/d β-alanine (BA) or Placebo (PL) microcrystalline cellulose for 28 days

Exercise capacity

- Cycle ergometer

Executive function

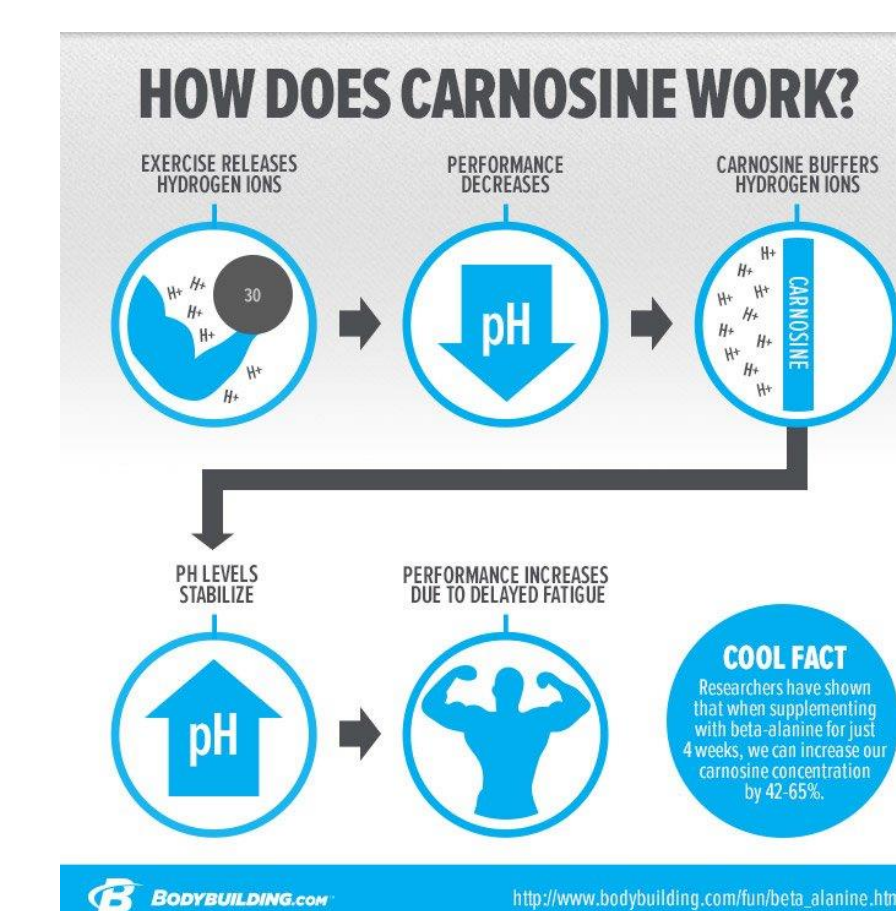
- Stroop test (TI-T4)

Exercise performance

- Time-to-Exhaustion (TTE)

Underlying Mechanisms

- Naturally occurring in meat, poultry, fish
- β-alanine + Histidine = Carnosine
- [Carnosine] in muscle tissue
- pH buffer



Exercise

Elastic Resistance Training

Journal of Exercise Rehabilitation (2018)

Question: Effect of elastic resistance training on glucose homeostasis, strength, and functionality in older adults with sarcopenia

Methods

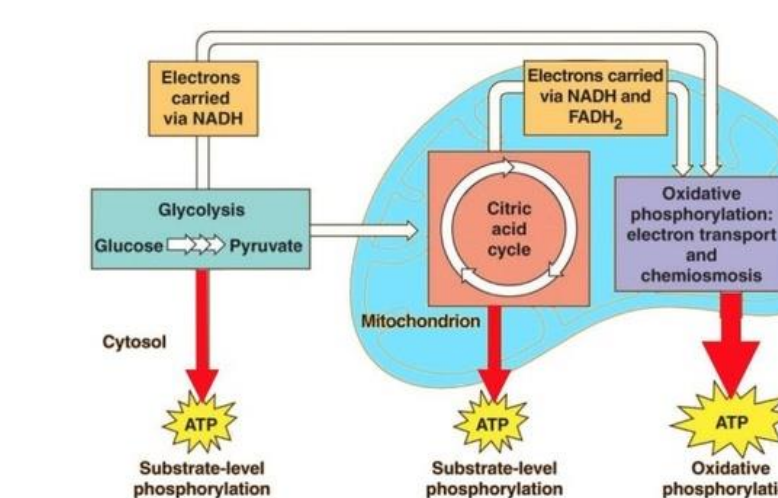
- 7 subjects with sarcopenia (age, 70.71±8.0 years)
- 12 weeks elastic RT

Tests

- Oral glucose tolerance
 - Type 2 Diabetes
 - Gestational Diabetes
- Handgrip strength
- Sit-to-stand
- 4-m walk

Underlying Mechanisms

- Exercise benefits those who are insulin resistant and do not have a stable glucose homeostasis
- Insulin allows the body to use glucose for energy via cellular respiration.
- Suppresses muscle protein degradation
- Ubiquitin-proteasome pathway: directly involved in protein break-down



Exercise Results

Table 1. Comparison between moments on handgrip strength and functionality

Variable	Baseline	12 Weeks	Δ	ES	P-value
HGS (kg)	24.3±5.7	27.3±7.3	3.0	0.46	0.01
4-m walk test (sec)	3.64±0.4	3.23±0.3	-0.4	1.13	0.04
STS (sec)	10.2±2.3	9.0±1.9	-1.2	0.57	0.04
Coordination test (sec)	15.9±3.6	11.7±1.4	4.2	1.68	0.08

Diet and Exercise

Whey Protein & Resistance Training

The Authors of Geriatrics and Gerontology International (2018)

Question: Effectiveness of nutritional supplementation ingested after resistance exercise on increasing muscle mass and physical function among older Japanese women

Results

Lower limb muscle mass

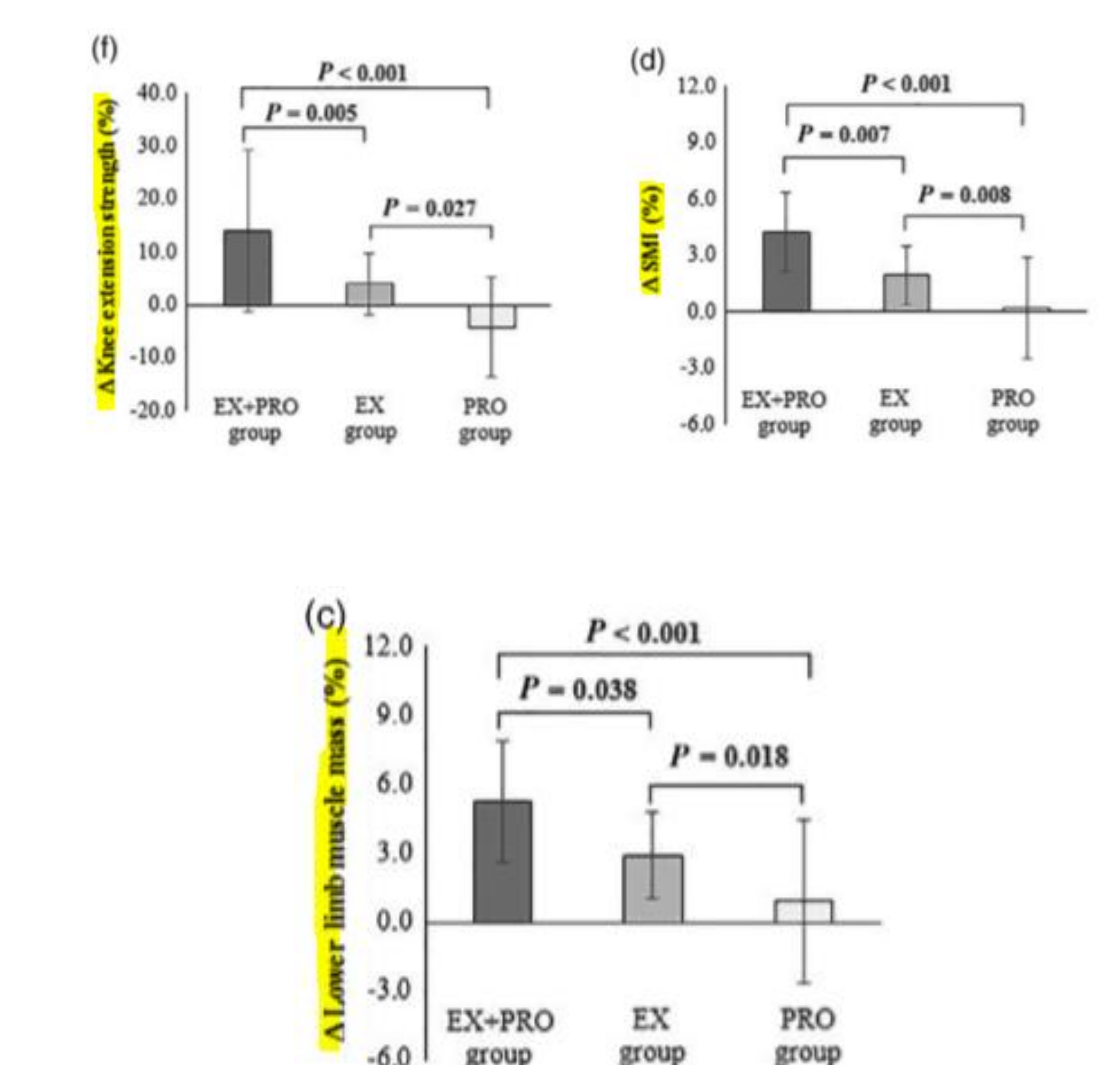
- P<0.001

Skeletal muscle mass

- P<0.001

Knee extension strength

- P<0.001



Discussion

Earlier adoption to a healthy lifestyle promotes best results regarding sustained muscle mass and strength over time. Those who are diagnosed with sarcopenia, however, may be able to increase muscle mass and strength via consistent exercise regimens and/or protein supplementation that is ingested right after exercise. Increases of muscle mass and strength in those with sarcopenia, primarily the elderly, will lead to decreased falls and injury and improve overall functionality, independence, and quality of life.

Acknowledgements

I would like to thank Dr. Gerald Schafer for his support and guidance. I would also like to thank the Health Sciences Department and Carroll College for resources used in this review.

Diet Results

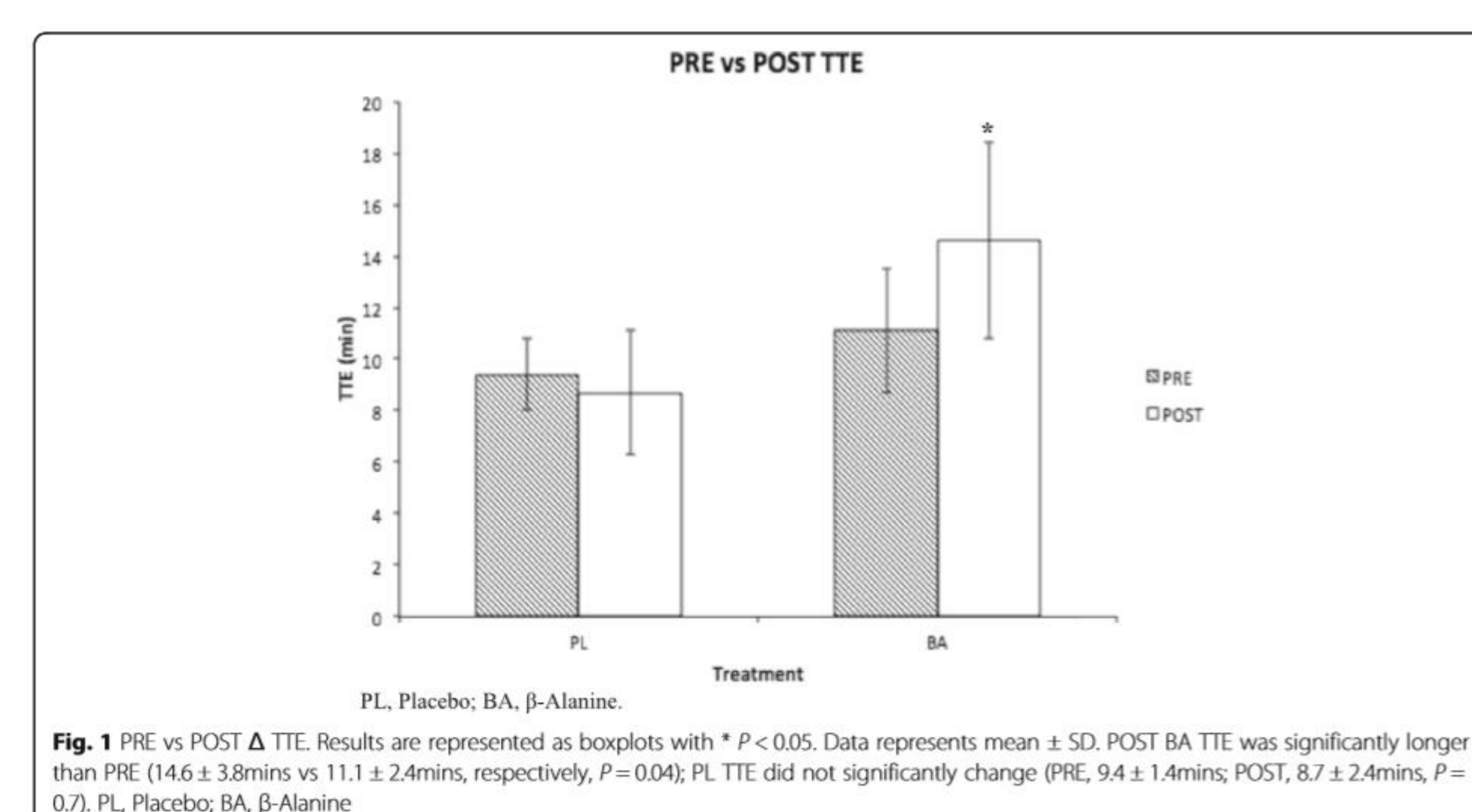


Fig. 1 PRE vs POST Δ TTE. Results are represented as boxplots with * P < 0.05. Data represents mean ± SD. POST BA TTE was significantly longer than PRE (14.6 ± 3.8mins vs 11.1 ± 2.4mins, respectively, P = 0.04). PL TTE did not significantly change (PRE, 9.4 ± 1.4mins; POST, 8.7 ± 2.4mins, P = 0.7). PL, Placebo; BA, β-Alanine