

TITLE: Optimizing Chronic Pain Treatment with Enhanced Neuroplastic Responsiveness (OPTIMIZE)

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RESEARCH PROJECT DESCRIPTION:

Background

Chronic pain is associated with functional and structural changes in the brain. Recent advances indicate promising opportunities to “re-open” and enhance neuroplastic responsiveness with non-pharmacological and non-invasive strategies. Strategies to maximize neuroplastic responsiveness to chronic pain treatment could enhance treatment gains by increasing neuroplasticity, learning, and positive adaptation. The intentions underlying the proposed study are to identify strategies to optimize the neurobiological environment to respond to clinical treatment interventions and override the maladaptive neuroplastic changes associated with chronic osteoarthritis pain.

Aims

- 1) *Determine whether food restriction and/or glucose administration will enhance neuroplastic responsiveness and improve learning retention thereby improving the effectiveness of guided imagery intervention in chronic pain patients;*
- 2) *Identify neurobiological and biological mechanisms underlying the proposed interventions.*

Methods

Adults with chronic knee osteoarthritis pain are randomized into one of three groups (intermittent fasting, glucose administration, control) and participate in 4 sessions over a 2-3 week period.

Medical Student Role

Assist with study sessions, data collection, and interpretation of findings.

Funding

American Pain Society and the Sharon S. Keller Chronic Pain Research Grant and UF CTSI Patient Oriented Pilot Award

Relevant Publications

Hensch & Bilimoria. Re-opening windows: Manipulating critical periods of brain development. *Cerebrum* 2012. pp. 1-18.

Martin et al. Caloric restriction and intermittent fasting: Two potential diets for successful brain aging. *Ageing Research Reviews* 2006;5:332-353.

Sibille KT, Bartsch F, Reddy D, Fillingim RB, Keil A (2016). Increasing neuroplasticity to bolster chronic pain treatment: A role for intermittent fasting and glucose administration? *Journal of Pain*. Epub PMID: 26848123

Smith et al. Glucose enhancement of human memory: A comprehensive research review of the glucose memory facilitation effect. *Neuroscience and Biobehavioral Reviews*, Vol. 35 2013. pp. 770-783.