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My research focuses on the psychobiological mechanisms of pain, fatigue and effort. My lab employs several experimental approaches to gain a better understanding of the effects of physical activity and exercise on subjective experiences and brain responses with a goal towards understanding how and for whom exercise can be used as an effective treatment. These studies have characterized pain intensity during exercise, tested the effects pharmacological manipulations on muscle pain perception, and determined the influences of disease on pain, fatigue and effort. My recent work focuses on using functional magnetic resonance imaging (fMRI) to understand central nervous system mechanisms of pain and fatigue in patients with fibromyalgia (FM), chronic fatigue syndrome (CFS) and veterans suffering from Gulf War Illness (GWI). Results from these investigations have demonstrated that, compared to healthy pain-free men and women patients with chronic pain and fatigue exhibit greater blood oxygen level dependent responses in pain-relevant brain regions in response to several tasks designed to examine the sensory, perceptual systems and cognitive systems. These studies have provided some of the first objective evidence in support of the perceptual experiences in these patient populations and have begun to determine how exercise affects the central nervous system.

A brief summary of my VA funded research appears below:

**1. Cook (PI)**

**Title - "Imaging Pain Modulation in Gulf War Veterans with Chronic Muscle Pain"**

Funding Source - Dept. of Veterans Affairs (CSR&D)

Start and End Dates - 10/01/08–09/30/12

Major Goals: To determine the psychophysical and neural aspects of pain modulation in GVs with chronic muscle pain (CMP) and test whether central nervous system modulation of pain is impaired in widespread CMP versus healthy veteran controls.

**2. Cook (PI)**

**Title - "Impact of exercise training on pain and brain function in Gulf War Veterans"**

Funding Source - Dept. of Veterans Affairs (CSR&D)

Start and End Dates - TBD

**Major Goals:** To determine the influence of resistance exercise training on symptoms, physical activity and brain structure & function in GVs with chronic muscle pain (CMP).