“Applying mathematical physiology to unravel compromised neuromuscular control in chronic pain”

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Chronic pain is defined as pain that outlasts the expected period of healing, and is a major cause of illness. Research in the last few decades has lead to a changing perception of chronic pain, from a manifestation of undetected pathology to a disease in and of itself. One common chronic pain disorder is Chronic Prostatitis / Chronic Pelvic Pain Syndrome (CP/CPPS). CP/CPPS is the most common urological diagnosis for men under 50, affects between 6 and 12 percent of the population, and accounts for 8% of urological visits and 1% of all primary care visits each year. An interesting feature of CP/CPPS is that pelvic musculature exhibits involuntary and sustained activity - which forms the therapeutic target of physical therapy. While some percentage of CP/CPPS patients improve with physical therapy, a substantial percentage do not, which indicates the need for rigorous mechanistic studies of the disorder. I will be starting the Applied Mathematical Physiology Laboratory (AMPL) in the Division of Biokinesiology and Physical Therapy at USC in the Fall of 2011. We have a funded pilot study with USC Physical Therapy Associates to investigate involuntary muscle activity in CP/CPPS. In this talk, I will 1) provide background on the CP/CPPS disorder, 2) highlight my previous research on non-invasive methods to identify the spinal regulation of muscle, and 3) describe our current efforts to link electrophysiology with fMRI imaging of brain and muscle to test the hypothesis CP/CPPS represents a condition in which activation of stress and emotional centers in the brain becomes coupled with pelvic muscle activation. The importance of approaching physiology from a mathematical perspective will be highlighted throughout.

Locations:
Seminar is simultaneously presented

**UPC:** HNB 100 – LIVE
Hedco Neurosciences Building
UPC Campus Map/Directions:
http://www.usc.edu/about/visit/upc/

**HSC:** CHP 147 — Video Conference Center for the Health Professional
HSC Campus Map/Directions:
http://www.usc.edu/about/visit/hsc/

Organized by Professor Francisco Valero-Cuevas
http://bbdl.usc.edu/ENH

Web Cast
http://capture.usc.edu/college/Catalog/pages/catalog.aspx?catalogId=846350f1-ca84-49e7-b867-e16adba01e4e