

# CMCC Donor Update

Thank you for your generosity! Without you, many innovative research projects and learning vehicles would not be possible.

**Here are some of the things we are working on...**

## Research Area: Physiological Effects of Chiropractic Adjustments

- What are the symptoms (including neurological) associated with whiplash and how can chiropractic adjustments impact them?
- What is the role of sensory input from the vertebral arteries in cardiovascular function and molecular responses to cervical adjustments?
- What are the neural and biomechanical responses to different types of cervical adjustments? Specifically, does a seated scalene adjustment effect the autonomic output to the heart and cause alterations in the levels of norepinephrine synthesis (sample population – asymptomatic subjects with cervical restrictions)?
- How do adjustments change the pro-inflammatory markers in acute and chronic mechanical low back pain patients? Assessing pro-inflammatory and anti-inflammatory mediators following baseline measurement and a series of six adjustments.

Results show that inflammatory markers in acute and chronic low back pain (LBP) patients are distinct, and that the production of selected nociceptive chemokines may be reduced. Some of the results have been published in the Clinical Journal of Pain (Clin J Pain 2018;34:68-75, Clin J Pain 2019;35:818-825). A paper currently in preparation will report on a similar study looking at the effects of lumbosacral adjustment on pro-and anti-inflammatory cytokine production.

- Are changes in cytokine levels following SMT related to changes in immune cell numbers and/or subtypes? Using blood samples from the same sample of LBP patients as indicated above.

- An extension of previously published studies on non-specific LBP looks at pro-inflammatory and anti-inflammatory cytokine expression in LBP patients to answer the question: What is the role of miRNAs in low back pain pathogenesis?
- Is there an association between manipulative forces and changes in the production of inflammatory markers? Using Force Sensing Table Technology® to provide precise forces.

## Research Area: McMorland Family Research Chair in Mechanobiology

The McMorland Family Research Chair in Mechanobiology investigates the impact of chiropractic care on spine health and activities of daily living. Specifically:

- What was the experience of practicing chiropractors with work-related musculoskeletal disorders over the previous year?

A study in collaboration with the Ontario Chiropractic Association and supported by a grant from the Centre of Research Expertise in the Prevention of musculoskeletal disorders (MSDs) that surveyed practicing chiropractors in Ontario. The prevalence of MSDs was highest for the neck, lower back and wrists/hands. Musculoskeletal issues in the upper extremity were commonly attributed to the act of performing spinal manipulation. Data will be used in subsequent work that will seek to reduce the risk of chiropractors sustaining work-related MSDs.

- What are the effects of instrument-assisted foot manipulation on a proxy for sprinting performance?

This study brought a performance context to neurophysiological results from other labs demonstrating increased peak muscular force and the rate of force production following manipulation. Our data, obtained from a small sample of elite short-distance runners, indicated an improvement on the proxy for sprinting performance following instrument-assisted foot manipulation.

- Are movement strategies adopted during a repetitive sit-stand movement test representative of those used rising from a chair?

Functional movements such as sit-to-stand have become more prominent in the assessment of patients with lower back pain.

The time to complete five cycles of a sit-to-stand movement is a reliable and valid way to objectively evaluate functional capacity of people with lower back pain, but the extent to which the movement strategies are adopted during this repetitive movement test are unknown.

The long-term objective of this work could be to identify a movement-based biomarker that could be used to identify and objectively monitor patients with lower back pain. Our first step was to describe the movement strategies used to complete the five-cycle sit-to-stand test and compare them to the

movement strategies used to perform a single repetition of rising from a seated position. Data from this initial study has been collected and is currently being analyzed.

## Research Area: Health Policy and Outcome-Based Research

- How do individuals from different groups view and implement research evidence into practice in the multi-disciplinary, multi-sector setting of motor vehicle collision injury claims? A qualitative study.

In Ontario, motor vehicle collisions are a leading cause of disability and health care utilization. Appropriate use of research evidence can optimize health outcomes but sub-optimal use can lead to system inefficiencies and poorer health outcomes. While much is known about the use of research evidence within individual practitioner groups, little is known about the use of evidence in the wider multi-sector setting.

This work will provide foundational information that could assist in understanding how to implement evidence to practice to improve health outcomes.

- What are the Canadian Armed Forces (CAF) patient perspectives of care delivered within the Canadian Forces Health Services (CFHS), their patient-related experiences when requesting or referred for chiropractic care, and why do they self-refer?

The CFHS provides a spectrum of health services in managing CAF members' health care needs with on- and off-base services provided by uniformed and civilian healthcare professionals including doctors of chiropractic (DC).

Researchers are assessing CAF patient members' experiences, interpretations, interactions and relationships surrounding chiropractic treatment of musculoskeletal conditions, within a real-life context. Specifically, they are seeking to explore CAF members' beliefs and experiences related to accessing self-referred chiropractic treatment.

- What are clinician and patient perceptions regarding strategies to mitigate benign adverse events following SMT?

Reports suggest about 50% of patients experience benign adverse events (bAEs) following spinal manipulation therapy (SMT). While most clinicians (88%) reported trying a mitigation strategy with their patients, most patients (56%) perceived their clinicians had not. Clinicians perceived that patient education either before or after treatment has the highest chance of mitigating bAEs after SMT, followed by soft tissue therapy and/or icing after SMT. Patients perceived stretching either before or after SMT is the strategy most likely to mitigate bAEs, followed by education and/or massage after SMT. This is the first investigation of clinicians and patients' perceptions of strategies to mitigate bAEs.

## **To learn more about these projects and research initiatives, please contact:**

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