THE EFFECTS OF MANUAL THERAPY ON CONCUSSION AS MEASURED BY DUPLEX DOPPLER ULTRASOUND

Leah Henderson – MSc Candidate

Introduction:
Annual concussion prevalence in Canada is 110 per 100,000 people however, the true annual rate is most likely higher as underreporting remains a problem. Currently, there is no gold standard diagnostic test or marker that health care practitioners can use to diagnose a concussion. Without an objective, standardized measurement tool available, practitioners rely on a multifaceted approach to diagnose a concussion. Current research on treatment interventions for concussion is limited and few, if any, use physiological measures to corroborate results, relying predominantly on subjective reporting of symptoms. Reduced cerebral blood flow (CBF) as a result of head trauma has been reported in both animal and human studies and may be used as a possible biomarker of concussion. In addition, the physiological effects of manual treatment on concussion treatment are limited and the effects have not been proven with scientific rigor.

Purpose:
1. To determine whether inexpensive and accessible tools such as duplex Doppler ultrasound, Polar™ heart rate monitors and Brain Dysfunction Indicator (BrDI™) can be used to identify potentially abnormal changes in blood flow, heart rate variability and cognitive motor integration respectively, as a result of concussion.
2. To assess the effects of manual treatment on blood flow in individuals with history of concussion, concussed individuals and healthy controls as measured by duplex Doppler ultrasound.

Methods:
Thirty participants will be recruited from York University, local clinics and surrounding areas. A single blinded pre-test and post-test experimental design is proposed to evaluate the effect of manual treatment for concussion symptoms. This design will assess the effects of manual treatment on blood flow measures in the vessels of the neck, responsible for providing total cerebral blood flow (CBF) in individuals with history of concussion (≥ 90 days), acutely concussed individuals (10 – <90 days post-injury) and healthy controls as measured by duplex Doppler ultrasound. Participants will be evaluated over the course of three visits and will receive two manual therapy treatments.

Expected Results:
Manual treatment will allow for increased cerebral blood flow (CBF) and decreased venous return through the internal jugular vein (IJV) in individuals with a history of concussion and acutely concussed individuals.