

FACT SHEET

CHIROPRACTIC, SENSORIMOTOR INTEGRATION AND FUNCTION

PROFESSOR BERNADETTE MURPHY,
UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY



Research Project Summary

Project Complete

Research has shown that chiropractic adjustments can improve reaction time, improve the timing of when postural muscles switch on, and improve the ability to perform tasks requiring co-ordination. The part of the brain which could be involved with these effects is the cerebellum, receiving information from the joints and muscles and communicating with all the other regions of the brain. This means that if there is a problem with the neck, it may not only cause neck pain, but it could actually affect the timing and co-ordination of movement and performing skills, as a result of the neck joints and muscles sending distorted feedback to the cerebellum. Thus, the cerebellum cannot perform optimally in its role in blending information from the brain and body. This project will further investigate how the cerebellum functions and how chiropractic adjustments affect the way that the cerebellum processes input from the joints and muscles from the hand and forearm. This project also plans to compare changes in the function of the cerebellum to the way that people perform tasks with their upper limbs following chiropractic adjustments. Tasks such as throwing, learning of new skills that challenge timing and use the hand muscles, and repositioning a subject's upper limb in space.

This research has the potential to be making a fundamental contribution to our understanding of the role and mechanism behind spinal adjustments. This will also help scientists to understand more about the way that the cerebellum functions when incoming sensory input is altered by spinal dysfunction. This work could have very important implications, perhaps suggesting that chiropractic care may be able to play a role beyond treating pain, and in fact possibly benefiting everyone.

Impact of Research

Awards

- World Federation of Chiropractic Biennial meeting 2015 - First Prize

Publications

- Baarbe J, Holmes MWR, Murphy HE, Haavik H, Murphy BA. Influence Subclinical Neck Pain on the Ability to Perform a Mental Rotation Task: A Four Week Longitudinal Study with a Healthy Control Group Comparison. Accepted, Journal of Manipulative and Physiological Therapeutics Volume 39, Issue 1, Pages 23–30.

Presentations

- Baarbé, J.*, Yelder, P., Haavik, H., Holmes, M., Murphy, B. (Accepted) Subclinical neck pain impairs the cerebellar response to motor training which is normalized following treatment with spinal manipulation. "Action & Perception: Cognition, Coding and Clinical Populations"; Canadian Action and Perception Network (CAPnet)-Canadian Physiological Society (CPS) Satellite Symposium of the Canadian Association of Neuroscience 10th Annual Meeting, Toronto, Canada, May 2016.
- Baarbé, J.*, Murphy, B., Haavik, H., Holmes, M. Subclinical Neck Pain Alters Upper Limb Kinematics during Dart Throwing. (Accepted) "Action & Perception: Cognition, Coding and Clinical Populations"; Canadian Action and Perception Network (CAPnet)-Canadian Physiological Society (CPS) Satellite Symposium of the Canadian Association of Neuroscience 10th Annual Meeting, Toronto, Canada, May 2016.
- Baarbé, J., Holmes, M., Murphy, H., Haavik, H., Murphy, B. Neck pain participants show impaired ability to perform a mental rotation task in a four week longitudinal study as compared to healthy controls. Proceedings of the 13th World Federation of Chiropractic Biennial Congress, Athens, Greece, May 13-16th, 2015 (Oral)*



FACT SHEET

CHIROPRACTIC “SUBLUXATION” MODEL FOR HUMAN RESEARCH

DR BARBARA POLUS, RMIT

AUSTRALIAN
spinal
research
FOUNDATION

- Baarbé, J., Murphy, B. Haavik, H., Holmes, M. Upper Limb Kinematics Differ between subclinical neck pain and healthy participants during a dart throwing task. Proceedings of the 13th World Federation of Chiropractic Biennial Congress, Athens, Greece, May 13-16th, 2015.
- Baarbé, J., Yelder, P., Haavik, H., Holmes, M., Debison-Larabie, C., Murphy, B. Enhanced cerebellar disinhibition when cervical manipulation precedes motor learning in individuals with subclinical neck pain. Proceedings of the 13th World Federation of Chiropractic Biennial Congress, Athens, Greece, May 13-16th, 2015. (Poster)
- Baarbé, J., Holmes, M., Murphy, H., Haavik, H., Murphy, B. Low Grade Neck Pain Interferes with the Ability to Perform a Mental Rotation Task. Sensorimotor Control Meeting, Brisbane, Australia, Feb 20-21, 2015, page 26.