

# Annual Progress Report

## The Effect of Spinal Manipulative Therapy on Three Key Motor Regions in the Cerebral Cortex

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### **1. Summary of Accomplishments in the Past Year**

With regards to the grant, we have made great progress. Initially, we have refined the protocol and the image acquisition parameters to optimize the data collected. We have enrolled and scanned sixteen (16) participants with another four (4) scheduled throughout this month. Of the participants that have already been scanned or are scheduled to be, ten (10) are symptomatic and ten (10) are asymptomatic. Recruiting is going well, with an additional five participants waiting to be screened and scheduled during May 2018. We therefore anticipate at least 25 participants by the end of May, thus putting us ahead of our recruiting time-table

### **2. Provide a one-paragraph summary of results or abstract suitable for posting on the Orthopaedic Section website.**

Due to the complexity of running the analysis, all fMRI analysis is planned on being completed at the end of the recruitment to better streamline the process. The amount of computing resources it takes to run a preliminary analysis on partial data makes this impractical. However, a summary of the project thus far is as follows:

Twenty participants have been recruited to participate in a study that examines cortical activation during exercise before and after spinal manipulation. The broader study assesses the difference in cortical activation between individuals with and without low back pain, and how the effects of spinal manipulation might differ in the presence of symptoms. We anticipate an additional twenty participants to be recruited over the next seven months with data being analyzed by the end of the calendar year.

3. Attach a list of your publications published or accepted during the past year, or currently being written. Send reprints when available. List presentations made and abstracts accepted for presentation based on this work. Indicate with an asterisk (\*) those publications supported by Orthopaedic Section Funding.

#### Manuscripts being written based on preliminary data

Silfies SP, Beattie P, **Jordon M**, Vendemia SA, Vendemia JMC. Functional MRI Protocol to Assess Sensorimotor Control of the Lumbopelvic-Hip Region. *Under Review Plos One*

Beattie P, **Jordon M**, Silfies SP, Stewart J, Vendemia JMC. Spinal manipulation alters task-based functional connectivity in individuals with chronic low back pain: a fMRI case series. *Currently being written. JOSPT*

Current Publications Related to This Project

Silfies S, Vendemia JMC, Beattie P, Stewart J, **Jordon M**. Changes in Brain Structure and Activation May Augment Abnormal Movement Patters: An Emerging Challenge in Musculoskeletal Rehabilitation. *Pain Medicine* 2017; 0; 1-4.

**Jordon M**, Beattie PF, D’Urso S, Scriven S. Pain pressure threshold is not affected by spinal manipulation performed on asymptomatic adults. *Journal of Manipulative and Physiologic Therapeutics* 2017; 25:172-181

National Presentation Based on this Work

**Jordon M**, Stewart J, Beattie PF, Silfies S, Vendemia J. Brain Activation During Lumbopelvic Exercises: An fMRI Study. *American Physical Therapy Association Combined Sections Meeting*, 2018.

**4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was ≥ 25% deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale.**

| Expense Category         | Budgeted Amount for Year 1 | Actual Amount Spent in Year 1 | Amount remaining in Year 1 Budget | Budgeted for Year 2 | Projected Expenditure in Year 2 |
|--------------------------|----------------------------|-------------------------------|-----------------------------------|---------------------|---------------------------------|
| Scan Time                | \$10,000                   | \$8,000                       | \$2,000                           | \$10,000            | \$11,200                        |
| Participant Remuneration | \$1,000                    | \$1,000                       | \$0                               | \$1,000             | \$1,400                         |
| <b>Total</b>             | \$11,000                   | \$9,000                       | \$2,000                           | \$11,000            | \$12,600                        |

From the time of the original budget and the initial approval of the funds to the start of data acquisition, there was a change in the fee structure at the MRI scanner. *The cost of running the scanner decreased from \$500 per hour to \$400 per hour.* This has resulted in a \$4,000 decrease in the amount of funds necessary to complete the 40 participants. With these additional funds, I would like to reserve enough to scan an additional 8 participants beyond the 40. This will allow for make-up scans if there is poor data (excess movement, poor activation, etc.) or additional scans for a more robust analysis. Even with the additional 8 scans, I will be \$400 under budget at the conclusion of this study.

## **5. Objectives for the next year.**

My first objective is to complete data collection. At the current rate of participant recruitment, I should be able to complete the collection in no more than 5-7 months. At the latest, I will complete data collection by November. This will allow for all data analysis to be completed by the end of the year, and for manuscript writing to begin no later than January 2019.