

**Orthopaedic Section of the APTA
Grant Program
Annual Progress Report Form**

Date: June 7, 2013

Name of Investigators: Rogelio A. Coronado, Steven Z. George, Mark D. Bishop, Joel E. Bialosky

Name of Grant: Cervical and Shoulder Manipulative Therapy on Shoulder Pain

Award Period: June 1, 2012 to May 31, 2014

Current Year of Award completed (circle one) 1st 2nd, no-cost extension year (3rd)

1. Summary of accomplishments in the past year:

Over the past year, we have dedicated significant effort to subject recruitment and enrollment and data collection. We aimed to enroll a total of 108 subjects, including 81 subjects with shoulder pain and 27 healthy, age and sex-matched control subjects, over the 2-year period. We hoped to enroll a majority of our subjects with shoulder pain over the 1st year. Currently, we have enrolled 44 subjects with shoulder pain and have successfully completed data collection (e.g. up to 3 month follow-up) on 28 subjects. While we did not reach our initial goal for subject recruitment in year 1, we are confident we will be able to complete subject enrollment by the year's end. We have presented preliminary data at a local conference and submitted a platform presentation to the Annual American Academy of Orthopedic Manual Physical Therapists Conference which will be held in Cincinnati, OH this October 2013.

2. Provide a one-paragraph summary of results or abstract suitable for posting on the Orthopaedic Section website. (The following abstract was submitted as a platform presentation to the Annual American Academy of Orthopedic Manual Physical Therapists Conference):

TITLE: Immediate Pressure and Thermal Pain Response is Associated with Change in Clinical Outcome Following Manual Therapy for Shoulder Pain

BACKGROUND & PURPOSE: An immediate response in pain sensitivity has consistently been observed following manual therapy. However, the relation of different aspects of pain sensitivity, such as static and dynamic responses or pressure and thermal stimuli, and the influence on clinical outcomes is not well established. We aimed to examine immediate, within-session changes in pressure and thermal pain sensitivity using static and dynamic responses and their associations with immediate and 1-week clinical outcome. **METHODS:** Data from 22 individuals with shoulder pain (mean age = 39.3, n of female = 11) were examined. Immediate changes in response to manual therapy were measured for pressure pain thresholds (PPT) at the shoulder, neck, and lower leg, and thermal heat threshold (HT) at the forearm and suprathreshold heat pain response (SHPR) at the forearm and lower leg. Immediate and 1-week changes were also examined for clinical pain,

range of motion (ROM), and pain with ROM. Bivariate associations were conducted between pain sensitivity and clinical outcome change. RESULTS: Immediate, positive changes in ROM, PPT at the shoulder and lower leg, and HT and 1-week changes in clinical pain and ROM were observed. Changes in PPT following manual therapy were associated with immediate change in clinical outcomes. Conversely, changes in SHPR, but not PPT, following manual therapy were predictive of 1-week clinical outcome. DISCUSSION-CONCLUSION: While preliminary, this data suggests that static measures of pain sensitivity like thresholds are associated with immediate clinical response; whereas dynamic measures like SHPR may predict longer term treatment response.

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 support by Orthopaedic Section funding.

Publications:

1. Coronado RA, JE Bialosky, ME Robinson, SZ George. Pain Sensitivity Subgroups in Individuals with Spine Pain: Potential Relevance to Short-term Clinical Outcome. Manuscript in preparation.
2. Sharififar S, Coronado RA, Romero S, Thigpen M. The effects of whole body vibration on mobility and balance in Parkinson's Disease: a systematic review. Submitted to Iranian Journal of Medical Sciences.
3. Coronado RA, Simon CB, Valencia C, George SZ. Experimental pain responses support peripheral and central sensitization in patients with unilateral shoulder pain. Accepted to Clin J Pain.
4. Slaven EJ, Goode A, Coronado RA, Hegedus EJ. The relative effectiveness of segment specific level and nonspecific level spinal joint mobilization on pain and range of motion: results of a systematic review and meta-analysis. J Man Manipulative Ther, 2013;21(1):7-17.
5. Gay CW, Alappattu MJ, Horn ME, Coronado RA, Bishop MD. The effect of a single session of muscle-biased therapy on pain sensitivity: a systematic review and meta-analysis of randomized controlled trials. J Pain Res, 2013;6:7-22. PMID: 23403507.
6. Coronado RA, Gay CW, Bialosky JE, Carnaby-Mann GD, Bishop MD, George SZ. Changes in pain sensitivity following spinal manipulation: a systematic review and meta-analysis. J Electromyography Kines. 2012;22(5):752-767. PMID: 22296867.

Presentations:

1. *Coronado RA, Simon CB, Mackie LN, Bialosky JE, Bishop MD, George SZ. Immediate pressure and thermal pain response is associated with change in clinical outcome following manual therapy for shoulder pain. Submitted as platform presentation at the Annual American Academy of Orthopedic Manual Physical Therapists Conference, Cincinnati, OH, October 2013.
2. Coronado RA, George SZ, Horn M, Bishop MD, Bialosky JE. Preliminary cluster analysis of experimental pain responses in patients with low back and neck pain.

Poster presentation at the International Association for the Study of Pain World Congress on Pain, Milan, Italy, 2012.

3. *Coronado RA, Simon CB, Bialosky JE, Bishop MD, George SZ. Does treatment location matter: immediate effects on pain processing in patients with unilateral shoulder pain. Poster presentation at Annual Neuromuscular Plasticity Symposium, University of Florida, Gainesville, FL, March 15, 2013.
4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was $\geq 25\%$ deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale. (See example below)

Expense Category	Budgeted Amount in Year 1	Actual Amount Spent in Year 1	Amount Remaining in Year 1	Budgeted for Year 2	Projected Expenditure for Year 2
Personnel compensation	\$6804.00	\$4142.61	\$2661.39	\$4536.00	\$7197.39
Materials & Supplies	\$1860.00	\$1180.90	\$679.10	\$0	\$679.10
Travel	\$750.00	\$597.80	\$152.20	\$750.00	\$902.20
Other Expenses	\$150.00	\$60.00	\$90.00	\$150.00	\$240.00
Total	\$9564.00	\$5981.31	\$3582.69	\$5436.00	\$9018.69

Deviation Rationale

Personnel compensation: We did not meet our goal for subject recruitment and enrollment for year 1. However, we have seen a rise in our recruitment pace for subjects with shoulder pain and we are confident we can complete enrollment by the end of 2013. We have initiated efforts to recruit subjects without shoulder pain and expect to complete enrollment this year as well.

Materials & Supplies/Other: We plan to use the remaining funds for year 1 at the beginning of year 2 as our recruitment/enrollment increases.

5. Objectives for the next year:

My objectives for the next year are to 1) complete clinical subject enrollment by November 2013, 2) initiate and complete healthy, age and sex-matched subject enrollment by November 2013, 3) finalize all data collection and analysis by February 2014, 4) submit at least 2 manuscripts to peer-reviewed journals by May 2014.

Signature

Date

6/7/13