

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

Date: 5/13/2014

Name of Investigators: Dana Judd, PT, DPT; Jennifer Stevens-Lapsley, PT, PhD

Name of Grant: Multi-component Rehabilitation Following Total Hip Arthroplasty

Award Period: 5/7/2012 to 5/6/2014 (Initial award date is the date that the award was made to your institution)

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

**Progress reports are due no later than 1 year plus 10 days after the initial award date. Failure to submit a timely progress report may result in the termination of your award.**

1. Summary of accomplishments in the past year:  
Subject enrollment was completed in February 2014. A total of 23 participants have enrolled to date, 20 participants completed the rehabilitation phase of the study. To date, 15 of the 20 subjects who completed the rehabilitation program have also complete outcomes assessment to the 6 month time point. Preliminary data analysis, using the 10-week primary outcome time point has been initiated.
2. Provide a one-paragraph summary of results or abstract suitable for posting on the Orthopaedic Section website.

**Summary Abstract**

Over 200,000 total hip arthroplasties (THAs) are performed annually in the United States to alleviate osteoarthritis-related pain and disability. This number is projected to exceed 500,000 per year by 2030. Though patients report pain reduction following surgery, deficits in muscle strength, neuromuscular control, and functional performance remain pronounced years after surgery. Although these residual deficits in muscle strength and functional performance are well documented, no evidence-based rehabilitation guidelines for THA exist. In fact, rehabilitation after THA is rarely prescribed, despite potential benefits. To date, most THA rehabilitation studies have been small-scale and have restricted recruitment to younger patients. Furthermore, despite the multifaceted deficits reported after THA and evidence that combined strength and neuromuscular control training improve outcomes in THA and in other populations, no studies have combined strength, neuromuscular control, and functional performance training into one intervention following THA. Therefore, investigating the effects of a multi-component rehabilitation program after THA on muscle strength, neuromuscular control and functional performance is warranted. Thus, the proposed exploratory investigation will compare the efficacy, feasibility, and safety of a comprehensive, multi-component (CMC) intervention with a control (CON) intervention. The CMC intervention will involve strength, neuromuscular control and functional training to improve muscle coordination around the hip and pelvis to enhance functional performance. The CON group will receive education and functional training. Intervention (2x/week for 8 weeks) will begin 2 weeks after THA. The stair climbing test (SCT; primary outcome) will assess functional performance before THA and 10 and 28 weeks after THA. Additional functional performance (Aim 1), lower extremity muscle strength (Aim 2), and safety (Aim 3) assessments will occur at the same time points. This study has high potential to shift current clinical practice and have an immediate impact because the CMC intervention can be easily implemented in most rehabilitation clinics.

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.

a. Publications during the past year:

Judd DL, Dennis DA, Wolfe P, Dayton MR, Stevens-Lapsley JE. Multi-component Rehabilitation Following Total Hip Arthroplasty: A Randomized, Controlled Trial. *Currently in progress.* \*

Thomas AC, Judd DL, Davidson BS, Eckhoff DG, Stevens-Lapsley JE. Quadriceps/Hamstrings Co-Activation Increases Early After Total Knee Arthroplasty. *Knee*. In review.

Davidson BS, Judd DL, Mizner RL, Eckhoff DG, Stevens-Lapsley. EMG Normalization in Patients with Muscle Activation Deficits: Comparison and Interpretation of Two Methods. *Gait Posture*. In review.

Judd DL, Dennis DA, Thomas AC, Wolfe P, Dayton MR, Stevens-Lapsley JE. Muscle Strength and Functional Recovery During the First Year Following THA. *Clin Orthop Relat Res*. 2014 Feb;472(2):654-64.

Judd DL, Thomas AC, Dayton MR, Stevens-Lapsley JE. Strength and Functional Deficits in Individuals with Hip Osteoarthritis Compared to Healthy, Older Adults. *Disabil Rehabil*. 2014;36(4):307-12.

Davidson BS, Judd DL, Thomas AC, Mizner RL, Eckhoff DG, Stevens-Lapsley JE Muscle activation and coactivation during five-time-sit-to-stand movement in patients undergoing total knee arthroplasty. *J Electromyogr Kinesiol*. 2013 Dec;23(6):1485-93.

b. Presentations and Abstracts:

Judd DL, Schlottman C, Dayton MR, Stevens-Lapsley JE. Comparison of Self-reported Function Using the HOOS and Performance-based Function After Total Hip Arthroplasty. Presented at the American Physical Therapy Association Combined Sections Meeting, February 2014.

Dennis DA, Judd DL, Dayton MR, Stevens-Lapsley JE. Comparison of Strength and Functional Outcomes during the first 6 months after THA and TKA. Presented at the Summer Meeting of the Hip Society 2013.

Judd DL, Sherk V, Rogers E, Kohrt WM, Stevens-Lapsley JE. Using Peripheral Quantitative Computed Tomography (pQCT) to Estimate Soft Tissue Characteristics in Patients with Knee Osteoarthritis. Accepted as a poster presentation, May 2013.

Judd DL, Struessel T, Eckhoff DE, Dayton MR, Stevens-Lapsley JE. Strength and Functional Outcomes after THA and TKA: A performance based, longitudinal study. Presented as a platform presentation for the Marilyn Gossman Graduate Student Seminar at the American Physical Therapy Association Combined Sections Meeting, January 2013.

Judd DL, Thomas AC, Wolfe P, Dennis D, Kim R, Dayton MR, Stevens-Lapsley JE. Time course of muscle strength and functional recovery during the first year following THA. Presented as a poster presentation at the American Physical Therapy Association Combined Sections Meeting, January 2013.

Dennis DA, Judd DL, Thomas AC, Wolfe P, Kim R, Dayton MR, Stevens-Lapsley JE. Functional Performance Recovery after THA. Presented as a platform presentation at the 2012 Summer Meeting of the Hip Society, September 2012.

Dayton MR, Judd DL, Thomas AC, Wolfe P, Dennis DA, Kim R, Stevens-Lapsley JE.  
 Physiologic and Functional Recovery Following Total Hip Arthroplasty versus Healthy Controls:  
 Outcomes at One Year. Presented as a poster at the American Association of Hip and Knee  
 Surgeons Annual Meeting, November 2012.

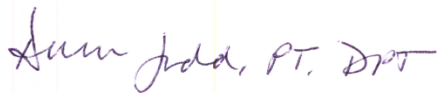
4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was > 25% deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale.

EXPENSE CATEGORY	AMOUNT REQUESTED	SPENT	BALANCE
Personnel	\$11,496	\$7,807	\$3,689.46
Supplies	\$1,360	\$661	\$699.48
Other	\$2,140	\$1,757	\$383.00
<b>Total projected costs</b>	<b>\$14,996</b>	<b>\$10,224</b>	<b>\$4,771.94</b>

**Deviations:**

*Personnel:* Dana Judd (PI) received a T32 pre-doctoral training award: Center Aging Training Grant T32-AG000279 which covers her salary through June 2014. The Research Assistants' effort was covered by different funding sources for year 1. We used the personnel funds for their year 2 effort. Remaining personnel funds will be used for the PI to complete the objectives outlined below.  
*Supplies:* We were able to secure temporary use of some exercise equipment and supplies at no cost for year 1. As such, we did not need to spend as much in this category. We would like to request any additional supply budget be transferred to cover personnel costs.

5. Objectives for the next year:  
 The objectives for the following year are 1) complete all long-term (28 week) data collection, 2) complete data analysis, 3) completion and submission of CSM abstract based on outcomes at primary endpoint (10 weeks) 3) completion of manuscript based on outcomes measured at primary endpoint (10 weeks) for publication by August 2014, and 4) complete NIH grant for Fall 2014 submission.



Your Signature

05/13/2014  
 Date

**Return to:**  
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