

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

Date: May 8, 2019

Name of the investigators: Federico Pozzi, PT, PhD

Name of the grant: Performance of shoulder muscles after a physical therapy intervention for patients with rotator cuff tears

Award period: 1 May 2018 – 30 April 2019

Current year of the award: Second

1) Summary of accomplishment in the past year

Work appointment

- Accepted a faculty position in the Department of Physical Therapy at the University of Florida. Started this appointment on September 4, 2018.
- Appointed as scholar on the Rehabilitation and Research Career Development grant (K21 HD055929) from the National Institutes of Health, Eunice Kennedy Shriver National Institute of Child Health and Human Development

Research

- Recruited and collected a total of 15 subjects for the project “Performance of shoulder muscles after a physical therapy intervention for patients with rotator cuff tears”, meeting the sample size goal. A total of 30 subjects (15 with and 15 without rotator cuff tears) will be included in the final analysis.
 - Preliminary results presented at the American Shoulder and Elbow Therapists Annual Conference: October 2018, Chicago, IL and Combined Section Meeting: January 2019, Washington, DC.
- Finished the data collection for the study: “Shoulder health in health professional at risk of shoulder pain”.
 - Dental hygienist year 1 cohort: total 24 participants. Completed all 5 data collection time points.
 - Dental hygienist year 2 cohort: total 25 participants. Completed all 5 data collection time points.
 - Occupational therapist year 1 cohort: total 57 participants. Completed all 3 data collection time points.
 - Preliminary results presented at the International Shoulder Group meeting: August 2018, Rochester, MN.
- Developed a project to analyze shoulder muscle activation during closed and open chain exercises for the shoulder.
 - Enrolled 22 participant.
 - Preliminary results presented at the International Shoulder Group meeting: August 2018, Rochester, MN; and Combined Section Meeting: January 2019, Washington, DC.
 - Full manuscript under review in the Journal of Electromyography and Kinesiology.
- Lead the effort for the writing of a systematic review and meta-analysis to identify predictors of shoulder and elbow injury in overhead athletes.
 - Screened more than 10000 articles for inclusion
 - Preliminary results presented at Combined Section Meeting: January 2019, Washington, DC; and accepted for presentation at the International Congress of Shoulder and Elbow Surgery: September 2019, Buenos Aires, Argentina.
 - Full manuscript under review in the British Journal of Sport Medicine

Teaching

- Instructor in the Evidence Based Practice course for physical therapist in the Doctor of Physical Therapy program at the University of Southern California.

- Instructor in the Functional Anatomy (module I and II) course in the Doctor of Physical Therapy program at the University of Florida.

Learning/career development

- Presented abstract work at four conferences: International Shoulder Group (August 2018, Rochester, MN), annual meeting of the American Society of Shoulder and Elbow Therapists (October 2018, Chicago, IL), APTA CSM (January 2019, Washington, DC), and Annual congress of the Italian Society of Physiotherapy (October 2018, Milan, Italy).
- Invited speaker for a seminar at the University of Milan (Professional opportunities for Italian physical therapists in the United States)
- Attended a total of 8 seminar, webinar, and orthopaedic surgery grand rounds organized by the Division of Biokinesiology and Physical Therapy, Southern California Clinical and Translational Science Institute, and Keck School of Medicine.
- Attended a total of 10 seminar, webinar, and orthopaedic surgery grand rounds organized by the Department of Physical Therapy and the Orthopaedic and Sports Medicine Institute at the University of Florida.
- Participated in the K-College, which is a career development monthly meeting for junior faculty organized by the CTSI of the University of Florida.
- Participated as panelist in an educational session titled: “The Dark Side of PubMed: Predatory Journals” at CSM (January 2019, Washington, DC)
- Guest speaker at the Annual Congress of the Italian Society of Physiotherapy. Title of the presentation: “Clinical practice guidelines for the management of patients with shoulder disorders”.
- Received the Outstanding (top 5%) reviewer award for *Arthritis Care and Research* Journal.
- Appointed in the Editorial Board of *Arthritis Care and Research* Journal.

Grant writing

- Submitted a grant to the Research Opportunities Seed Fund of the University of Florida. Project title: “A Novel Experimental and Computational Framework to Elucidate Biomechanical Mechanisms of Symptomatic Rotator Cuff Tears”. Status: not funded.
- Submitted a grant to the Research grant program of the Academy of Orthopaedic Physical Therapy. Project title: “Interpreting changes of shoulder strength in patients with shoulder pain undergoing physical therapy: minimal detectable change, responsiveness, and minimal clinically important difference”. Status: not funded.
- Preparing a R21 grant (FOA PA-19-053) for submission to the National Institute of Health, Institute of Arthritis and Musculoskeletal and Skin Diseases. Project title: “Magnetic resonance spectroscopy biomarkers of muscle degeneration in patients with rotator cuff tears”.

2) Provide a one paragraph summary of results or abstract suitable for posting on the Orthopaedic Section website:

My research interests focus on understanding the impact of physical therapy on the recovery of patients with musculoskeletal conditions of the upper and lower extremities. I assess patients’ recovery using a comprehensive set of biomechanical (motion capture), clinical, and patient-reported outcomes. My goal is to identify predictors of successful outcomes following physical therapy interventions. I plan to use the evidence derived from my research to develop innovative physical therapy approaches to optimize care and maximize functional recovery. For this Career Development Grant, my plan included protected time to conduct research, focused coursework, and mentorship from established investigators.

Research: I managed a clinical trial that aims to assess the feasibility of a standardized rehabilitation protocol for patients with full thickness rotator cuff tears. Further, I collected a comparison group of matched individuals without shoulder pain. Participants were evaluated using a comprehensive battery of patient-rated outcomes, clinical measures, and biomechanical assessment. This comparison will provide detailed information on the recovery of impairments and patient-rated disability in patients with full thickness tears after undergoing the standardized rehabilitation protocol.

Focused coursework: I attend several workshops and seminars offered through the University of Southern California and University of Florida.

Mentorship: I was mentored by a diverse team of senior investigators with expertise in shoulder assessment and physical therapy, clinical trials design and management, proposal and scientific writing, and statistical modeling.

In conclusion, during this career development grant, I acquired four major skills related to: 1) the design and conduction of a clinical trial in rehabilitation medicine; 2) the assessment of functional loss and biomechanical impairments in patients with shoulder disorders; 3) the design of a rehabilitation intervention to address movement impairments in upper extremity disorders; 4) advanced biostatistical analysis methods. Completing this training gave me the necessary skills to become an independent clinician-scientist.

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.

Publication in referred journals:

1. **Pozzi F**, Plummer HA, Lee Y, Sanchez N, Michener LA. Electromyography activation of shoulder and trunk muscles is greater during closed chain compared to open chain exercises. *Journal of Electromyography and Kinesiology*. [Accepted]
2. **Pozzi F**, Plummer HA, Bauer C, Shanley E, Thigpen C, Wilson M, Michener LA. Pre-season screening of shoulder range of motion and in-season risk of shoulder and elbow injury in overhead athletes: a systematic review and meta-analysis. *British Journal of Sport Medicine*. [In review]
3. Young I, **Pozzi F**, Dunning J, Linkonis R, Michener LA. Immediate and Short Term Effects Of Thoracic Spine Manipulation In Patients With Cervical Radiculopathy: A Randomized Controlled Trial. *Journal of Orthopaedic and Sports Physical Therapy*. [in press]
4. Adams D, **Pozzi F**, Willy R, Carrol A, Zeni J. (2018) Altering Cadence or Vertical Oscillation During Running: Effects on Running Related Injury Factors. *International Journal of Sport Physical Therapy*, 13(4), 633-642.
5. **Pozzi F**, White DK, Snyder-Mackler L, Zeni J Jr. (2018) Restoring physical function after total knee arthroplasty: a cross sectional comparison of progressive strengthening vs. standard physical therapy. *Physiotherapy Theory & Practice*. [Epub]

4) Budget:

Expense Category	Year 1			Year 2 USC: from 05/01 to 06/30/2018 UF: from 10/01/2018 to 04/30/2019				
	Budgeted year 1	Actual amount spent year 1	Amount remaining in year 1 budget	Budgeted year 2	Actual amount spent year 2 (USC)	Amount transferred to UF	Actual amount spent year 2 (UF)	Amount remaining in year 2 budget
Study Personnel: PI	\$18,834	\$19,238	-\$404	\$19,306	\$3874.46	\$15,431.54	0	\$15,431.54
Study Personnel: Consultants	\$2,500	\$1,000	\$1,500	\$2,500	0	\$4,000	0	\$4,000
Supplies & Participant Reimbursements	\$1,750	\$1,450	\$300	\$500	\$581.24	\$218.76	\$49.99	\$168.77
Travel	\$1,500	\$1,500	\$0	\$3,000	0	\$3,000	\$3,494.31	-\$494.31
Total	\$24,584	\$23,188	\$1,396	\$25,306	\$4,455.7	\$22,650.30	\$22,650.30	\$19,105.91

5) Objectives for the next year:

The objective for next year is to complete the data analysis of the research project that will compare patients with full thickness tears and healthy controls. A preliminary data analysis was presented as abstract to CSM2019. I will also leverage the finding of this study to apply for a grant from the NIH to investigate mechanism of persistent weakness in patients with rotator cuff tears who underwent physical therapy.