



Academy of Orthopaedic Physical Therapy, APTA, Inc. Grant Program Annual Progress Report Form

Date: 9

8/20/2024

Name of Investigators: Patrick Corrigan, PT, DPT, PhD; Joshua Stefanik, MSPT, PhD; David Felson, MD, MPH; Tuhina Neogi, MD, PhD; Cara Lewis, PT, PhD; Michael LaValley, PhD

Name of Grant: Effect of unilateral knee pain on contralateral knee joint loads while walking: implications for the development of bilateral knee pain and osteoarthritis

Award Period: 12/1/2021 to 11/30/2024

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 since the last progress report (9/28/2023):

- All data collections have been completed for Aims 1 and 2
- Awarded \$375,000 grant as PI from Rheumatology Research Foundation
- Awarded \$25,000 grant as Co-I from Saint Louis University
- 17 peer reviewed abstracts accepted and presented at national and international conferences
- 2 middle-author publications
- Started working with my 2nd PhD student
- Served on a NIH study section for the 1st time
- Received Excellence in Scholarship Award from Doisy College of Health Sciences at Saint Louis University

2. Provide a one-paragraph summary of results or abstract suitable for posting on the Academy website.

I am currently investigating if biomechanical mechanisms play a role in unilateral to bilateral knee osteoarthritis progression. Specifically, I am evaluating the effect of pain on walking biomechanics in individuals with unilateral symptomatic knee osteoarthritis and exploring how walking biomechanics influence longitudinal pain and structural outcomes. I am hopeful that our findings inform medical management, walking program design, and the development of targeted physical therapy interventions that reduce pain, maximize function, and slow the progression of knee osteoarthritis.

2. 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 Academy of Orthopaedic Physical Therapy funding.

Publications since last progress report:

1. Seymore KD, Corrigan P, Sigurðsson HB, Pohlig RT, Grävare Silbernagel K. Asymmetric running is associated with pain during outdoor running in individuals with Achilles tendinopathy in the return-to-sport phase. *Phys Ther Sport*. 2024 May;67:25-30. doi: 10.1016/j.ptsp.2024.02.006. Epub 2024 Mar 6. PMID: 38460486; PMCID: PMC11162939.
2. Bacon KL, Felson DT, Jafarzadeh SR, Kolachalama VB, Hausdorff JM, Gazit E, Stefanik JJ, Corrigan P, Segal NA, Lewis CE, Nevitt MC, Kumar D. Gait Alterations and Association With Worsening Knee Pain and Physical Function: A Machine Learning Approach With Wearable Sensors in the Multicenter Osteoarthritis Study. *Arthritis Care Res (Hoboken)*. 2024 Jul;76(7):984-992. doi: 10.1002/acr.25327. Epub 2024 Apr 17. PMID: 38523250; PMCID: PMC11209802.

Abstract Presentations since last progress report:

- *1. Price SK, Stefanik JJ, Lewis CL, Davis IS, Felson DT, Corrigan P. Effect of gradient on walking biomechanics in adults

with knee osteoarthritis. American Society of Biomechanics Annual Meeting. Platform.

*2. Daradkeh SM, Price SK, Fennell KA, Willson J, Stefanik JJ, Corrigan P. Spatiotemporal gait metrics and their relation to medial knee joint contact forces in adults with knee osteoarthritis. American Society of Biomechanics Annual Meeting. Poster.

*3. Daradkeh SM, Price SK, Silbernagel KG, Stefanik JJ, Corrigan P. Relation of knee extensor tendon mechanical properties to dynamic knee joint stiffness in adults with knee osteoarthritis. Orthopaedic Research Society Tendon Conference. Poster.

4. Price SK, Silbernagel KG, Felson DT, Stefanik JJ, Corrigan P. Comparing knee extensor tendon properties and determining relationships to pain in adults with and without knee osteoarthritis. Orthopaedic Research Society Tendon Conference. Platform.

5. Corrigan P, Hanselman A, Seymore KD, Pohlig RT, Silbernagel KG. Changes in tendon forces during prolonged running in adults with Achilles tendinopathy. Orthopaedic Research Society Tendon Conference. Poster.

6. James KA, Corrigan P, Yen SC, Hasson CJ, Davis IS, Stefanik JJ. Effects of increasing walking cadence on knee joint loading and pain in adults with knee osteoarthritis. American College of Sports Medicine Annual Meeting. Thematic Poster.

7. Price SK, Silbernagel KG, Felson DT, Stefanik JJ, Corrigan P. Comparing knee extensor tendon mechanical properties between adults with and without knee osteoarthritis. Osteoarthritis Research Society International Word Congress. Poster.

*8. Price SK, Silbernagel KG, Felson DT, Stefanik JJ, Corrigan P. Relationships between extensor tendon mechanical properties and dynamic knee joint stiffness in adults with knee osteoarthritis. Osteoarthritis Research Society International Word Congress. Poster.

9. Huang CH, Shefelbine S, Corrigan P, James KA, Lanois C, LaValley MP, Davis IS, Stefanik JJ. Change In Medial Joint Contact Forces Following Gait Retraining in Individuals With Knee Osteoarthritis. Orthopedic Research Society Annual Meeting. Poster.

*10. Price SK, Stefanik JJ, Willson JD, Lewis CL, Davis IS, Felson DT, Corrigan P. Changes in knee joint contact forces during prolonged walking in adults with knee osteoarthritis. American Physical Therapy Association's Combined Sections Meeting. Poster.

11. Price SK, Silbernagel KG, Felson DT, Stefanik JJ, Corrigan P. Comparing patellar tendon characteristics between adults with and without knee pain. American Physical Therapy Association's Combined Sections Meeting. Poster.

12. James KA, Corrigan P, Lanois C, Huang CH, LaValley MP, Davis IS, Stefanik JJ. Effect of gait retraining on knee pain and loading in adults with knee osteoarthritis. American Physical Therapy Association's Combined Sections Meeting. Poster.

13. Huang CH, Shefelbine S, Corrigan P, James KA, Lanois C, LaValley MP, Davis IS, Stefanik JJ. Changes in joint forces following gait retraining in people with knee osteoarthritis. American Physical Therapy Association's Combined Sections Meeting. Platform.

*14. Fennell K, Price SK, Willson JD, Corrigan P. Relation of spatiotemporal gait metrics to knee joint contact forces in adults with knee osteoarthritis. American Physical Therapy Association's Combined Sections Meeting. Poster.

15. Lanois C, Corrigan P, Huang CH, James KA, Stefanik JJ. Ultrasound-assessed femoral cartilage thickness is associated with knee adduction moment in adults with knee OA. American Physical Therapy Association's Combined Sections Meeting. Poster.

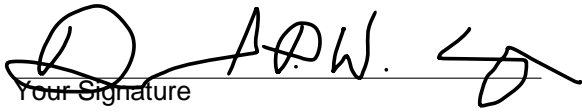
4. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was $\geq 25\%$ deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale. (See example below)

EXPENSE CATEGORY	Total Budgeted Amount	Amount Spent	Amount Remaining	Projected Expenditures 8/20/24-11/30/24
Personnel	20,210	5,426.01	16,480.34	16,480.34
Supplies	4,200	3,651.13	0	0
Participant Costs	4,695	3,316.84	0	0
Other	895	895	230.00	230.00
TOTAL	30,000	13,288.98	16,710.34	16,710.34

\$5,546.67 will be used to support Dr. Corrigan's salary and fringe. This amount is line with the already approved budget and ensures compliance with the policy of \$9,000 maximum for PI salary support. The remaining \$10,933.68 for personnel that is already approved for research assistant support, will be used to support Samantha Price, a PhD student who has relocated with Dr. Corrigan to Cleveland Clinic. Because supplies and participant costs are no longer needed, we are requesting for a GraphPad license (1 license covers 2 computers) for figure making.

5. Objectives for the next year:

- Finish all data processing and analysis
- Publish at least 3 peer-reviewed manuscripts from research funded by AOPT
- Present final data at 2 national conferences

 A handwritten signature in black ink, appearing to read "A.P.W." followed by a stylized flourish.

Your Signature

8/21/2024

Date

Return to:

Tara Fredrickson, Assistant Executive Director
Academy of Orthopaedic Physical Therapy, APTA, Inc.
2920 East Avenue South, Suite 200
La Crosse, WI 54601-7202
tfred@orthopt.org