Lou Awad | PT, DPT, PhD

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🏠 Neuromotor Recovery Laboratory

APPOINTMENTS

Academic

Boston University
2023–Present: Associate Professor, Department of Physical Therapy
2019–Present: Faculty, Neurophotonics Center, Department of Biomedical Engineering
2016–2023: Assistant Professor, Department of Physical Therapy (Mechanical Engineering, secondary)

Rutgers University
2009: Adjunct Professor, Department of Kinesiology and Health

Research

Boston University
2016–Present: Director, Neuromotor Recovery Laboratory

Harvard University
2016–2020: Associate Faculty Member, Wyss Institute for Biologically Inspired Engineering
2020–Present: Founding Faculty Member, Harvard MOVE Lab

Harvard Medical School
2016–Present: Associate, Department of Physical Medicine and Rehabilitation
2017–Present: Research Faculty, Stroke Wellness Institute, Spaulding Rehabilitation Hospital

Clinical

University of Delaware Neurologic and Older Adult Physical Therapy Clinic, Newark, DE
2012–2014: Clinical Instructor and Physical Therapist (PRN)

Omega Medical Center, Newark, DE
2013–2014: Physical Therapist (PRN)

Rehabilitation Consultants Inc, Wilmington, DE
2012–2013: Physical Therapist (PRN)

ADVISORY POSITIONS

MedRhythms Inc, Portland, ME
2016–Present: Board of Advisors
2019–Present: Stroke Rehabilitation Scientific Advisory Board
2020–Present: Chief Science Advisor

ReWalk Robotics Ltd, Marlborough, MA
2016–Present: Stroke Rehabilitation Scientific Advisory Board

Wyss Institute for Biologically Inspired Engineering, Cambridge, MA
2014: Clinical Consultant

EDUCATION AND TRAINING

Harvard University, Cambridge, MA
01/2015–07/2016: Postdoctoral Fellowship. Specialization: Wearable Technology

University of Delaware, Newark, DE
01/2012–12/2014: PhD, Biomechanics and Movement Science. Specialization: Motor Control
06/2009–01/2012: DPT, Doctor of Physical Therapy. Specialization: Neurologic Physical Therapy

Rutgers University, New Brunswick, NJ
09/2004–05/2008: BS, Exercise Science. Minor: Psychology

LICENSES AND CREDENTIALS

Massachusetts Board of Allied Health Professions
2015–Present: Licensed Physical Therapist (21530)

Delaware Examining Board for Physical Therapists
2012–2015: Licensed Physical Therapist (J1-0002848)

American Physical Therapy Association
2012–Present: Credentialed Clinical Instructor

HONORS AND AWARDS

2023: Finalist, Clinical Biomechanics Award, American Society of Biomechanics Annual Meeting

2023: Ignition Award, Boston University Office of Technology Development

2021: Best Paper Award, IEEE Conference on Neural Engineering

2021: Ignition Award, Boston University Office of Technology Development

2021: Graduate Speaker Award (DAR), Marilyn Gossman Seminar, APTA Combined Sections Meeting

2021: Graduate Speaker Award (AR), Marilyn Gossman Seminar, APTA Combined Sections Meeting

2020–2021: Top 5 Research Outputs, Journal of NeuroEngineering and Rehabilitation (two top 5 papers)

2020: Most Impactful Paper, IEEE Open Journal of Engineering in Medicine and Biology

2020: Featured author, Academy of Neurologic Physical Therapy Research Q&A

2019: Top Downloaded Paper 2018-2019, PM&R Journal

2019: Editor's pick, Journal of Neurologic Physical Therapy

2019: Fellow, American Heart Association Research Leaders Academy

2017–2019: KL2 Clinical Scholar Award, Boston University Clinical and Translational Science Institute

2018: Best Paper Award in Medical Robotics, IEEE Conference on Robotics and Automation

2017: Finalist for Best Presentation Award, IEEE Symposium on Wearable and Rehabilitation Robotics

2017: Fellow, Training in Grantsmanship for Rehabilitation Research (TIGRR) Program

2015: Graduate Speaker Award, Marilyn Gossman Seminar, APTA Combined Sections Meeting

2015: Finalist for Best Paper Award, IEEE Conference on Rehabilitation Robotics

2015: Featured article, PTinMotion News

2014: Editor's pick, Lower Extremity Review Magazine

2013: Featured article, Orthotics and Prosthetics Business News

2010–2014: DPT/PhD Trainee, NIH NRSA T32 Award to University of Delaware

2008: Man of the Year Award, Rutgers University Office of Student Life

2008: Distinguished Leader Award, Rutgers University Office of Student Life

2008: Pillar of the Community Award, Rutgers University Office of Student Life

2004–2008: University Merit Award, Rutgers University

GRANT FUNDING (For multi-institution awards, only Boston University funding is reported)

Active Funding ($5.4MM in Active Funding as Principal Investigator)

Granting Agency: MedRhythms, Inc
Title: Development and Evaluation of Music-Based Digital Therapeutics
Period of Performance: 10/2021–10/2025
Role: PI

Granting Agency: National Institutes of Health (UH2AR076731) (PI: Walsh)
Title: Development, evaluation, and translation of robotic apparel for alleviating low back pain
Period of Performance: 09/2019–09/2024
Role: PI-Subcontract

Granting Agency: MassTech Collaborative Research Matching Grant (PI: Walsh)
Title: Connected software-hardware platform for enabling tele-rehabilitation of soft robotic systems
Period of Performance: 09/2021–06/2024
Role: PI-Subcontract

Granting Agency: ReWalk Robotics, Ltd
Title: Usability of the ReWalk 7.0 Exoskeleton by Individuals with Spinal Cord Injury
Period of Performance: 11/2022–11/2023
Role: PI

Granting Agency: National Science Foundation (1925085) (co-PIs: Walsh, Awad, Ellis)
Title: Wearable Robots for the Community: Personalized Assistance using Human-in-the-loop Optimization
Period of Performance: 09/2019–08/2023
Role: co-PI and PI-Subcontract

Granting Agency: National Institutes of Health (R01AG067394) (MPI: Awad and Tron)
Title: SCH: Multimodal, Task-Aware Movement Assessment and Control: Clinic to Home
Period of Performance: 09/2019–05/2023
Role: PI

Granting Agency: National Institutes of Health - Blueprint MedTech Award Program
Title: The reNeu propulsion neuroprosthesis for gait restoration after neurological injury
Period of Performance: 01/2022–05/2023 (NCE)
Role: PI

Granting Agency: Boston University Office of Technology Development - Ignition Award
Title: The reNeu propulsion neuroprosthesis for gait restoration after neurological injury
Period of Performance: 11/2021–05/2023 (NCE)
Role: PI

Completed Funding ($1.2MM in Completed Funding as Principal Investigator, $1.7MM total)

Granting Agency: American Heart Association - Transformational Research Award (18TPA34170171)
Title: Robotic Exosuit Augmented Locomotion (REAL) training in the clinic and community
Period of Performance: 07/2018–06/2022 (NCE)
Role: PI

Granting Agency: American Heart Association - Innovative Project Award (18IPA34170487)
Title: Task-aware movement assessment: Smart control of assistive technologies and automated diagnostics
Period of Performance: 07/2018–06/2022 (NCE)
Role: PI

Granting Agency: MedRhythms, Inc
Title: Post-stroke walking speed and community ambulation conversion, a pivotal study
Period of Performance: 06/2019–06/2022 (NCE)
Role: PI

Granting Agency: MedRhythms, Inc (PI: Ellis)
Title: Feasibility and preliminary effects of a music-based digital therapeutic for persons with Parkinson's
Period of Performance: 05/2021–06/2022
Role: Co-I

Granting Agency: National Institutes of Health (R01HD088619) (PI: Walsh)
Title: Development of a modular soft exosuit platform suitable for community-based neurorehabilitation
Period of Performance: 09/2016–05/2022 (NCE)
Role: Co-I

Granting Agency: Wyss Institute for Biologically Inspired Engineering
Title: reNeu: A next-generation neuroprosthesis for gait-restoration after stroke
Period of Performance: 07/2019–07/2020
Role: PI

Granting Agency: Wyss Institute for Biologically Inspired Engineering
Title: Development of Stroke and Multiple Sclerosis Soft Exosuits
Period of Performance: 06/2018–06/2020
Role: PI-subcontract

Granting Agency: Boston University Clinical Translational Science Institute
Title: Integrated Pilot Grant: Brain-machine interface for a soft robotic exosuit
Period of Performance: 09/2018–08/2019
Role: PI

Granting Agency: MedRhythms, Inc
Title: Feasibility and preliminary effects on poststroke locomotion of music-based rhythm modulation
Period of Performance: 07/2018–07/2019
Role: PI

Granting Agency: National Institutes of Health - KL2 Award to BU-CTSI (KL2TR001411) (PI: Center)
Title: Wearable sensors for measuring propulsive force generation during walking after stroke
Period of Performance: 04/2017–03/2019
Role: PI of KL2 project

Granting Agency: ReWalk Robotics, Ltd
Title: Multi-site, interventional, non-comparative trial to evaluate the safety of the ReWalk Restore
Period of Performance: 02/2018–01/2019
Role: PI

Granting Agency: Boston University Clinical Translational Science Institute
Title: Integrated Pilot Grant: Integrating computer vision with wearable sensors to improve the assessment and delivery of targeted locomotor interventions and technologies
Period of Performance: 01/2017–01/2018
Role: PI

Granting Agency: American Heart Association (15POST25090068)
Title: Next generation robotics: A soft exosuit for community-based rehabilitation after stroke
Period of Performance: 07/2015–06/2017
Role: PI

External Sponsored Trainee Funding ($300k in External Sponsored Trainee Funding)

Granting Agency: Foundation for Physical Therapy Research PODS II Scholarship
Title: Does a personalized music-based digital therapeutic increase walking performance and automaticity in people with Parkinson disease?
Period of Performance: 09/2022–08/2023
Predoctoral Fellow: Jenna Zajac
Role: Co-Mentor

Granting Agency: American Heart Association (830019)
Title: A propulsion neuroprosthesis for clinic and community-based walking rehabilitation after stroke
Period of Performance: 07/2022–06/2024
Predoctoral Fellow: Ashlyn Aiello
Role: Sponsor and primary advisor

Granting Agency: National Institutes of Health (1F31HD106777)
Title: From assistance to rehabilitation: Neuromuscular adaptations to walking with a soft robotic exosuit
Period of Performance: 09/2021–08/2023
Predoctoral Fellow: Ashley Collimore
Role: Sponsor and primary advisor

Granting Agency: National Science Foundation - UtB: Neurophotonics Traineeship (PI: Boas)
Title: Cortical adaptations to walking with a soft robotic exosuit
Period of Performance: 07/2020–06/2022

Predoctoral Fellow: Regina Sloutsky
Role: Sponsor and primary advisor

Granting Agency: American Heart Association (19PRE34430087)
Title: Soft robotic exercise intervention for enhancing neuroplasticity after stroke
Period of Performance: 01/2019–12/2020
Predoctoral Fellow: Anna Roto
Role: Sponsor and primary advisor

Internal Sponsored Trainee Funding

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Accuracy of a portable device for measuring plantarflexor muscle strength and central drive
Period of Performance: 06/2022–09/2022
Undergraduate Fellow: Noah Barrow
Role: Sponsor and primary advisor

Granting Agency: Boston University Sargent College - Student Research Award
Title: Enhancing exercise intensity with a soft robotic exosuit: Effects on brain-derived neurotrophic factor
Period of Performance: 05/2021–05/2022
Predoctoral Fellow: Anna Roto
Role: Sponsor and primary advisor

Granting Agency: Boston University IHSIP - Summer Student Research Award
Title: Stepping into new digital paradigms: Gait data for movement phenotyping, diagnosis, and prognosis
Period of Performance: 06/2021–09/2021
Predoctoral Fellow: Dheepak Arumukhom Revi
Role: PI

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Turn detection with wearable inertial sensors
Period of Performance: 06/2021–12/2021
Undergraduate Fellow: William Swift
Role: Sponsor and primary advisor

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Robotic Exosuit Augmented Locomotion (REAL) gait training after stroke
Period of Performance: 06/2021–09/2021
Undergraduate Fellow: Nora Chan
Role: Sponsor and primary advisor

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Electromyography processing to detect muscle fatigue in stroke patients
Period of Performance: 06/2020–09/2020
Undergraduate Fellow: Josh Singh
Role: Sponsor and primary advisor

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Real-time analysis of muscle dynamics using ultrasound for physical therapy applications
Period of Performance: 10/2017–05/2018
Undergraduate Fellow: Ashlyn Aiello
Role: Sponsor and primary advisor

Granting Agency: Boston University Undergraduate Research Opportunities Program
Title: Modulating the economy and stability of hemiparetic walking using rhythmic auditory stimulation
Period of Performance: 06/2017–08/2017
Undergraduate Fellow: Arianna DiGregorio
Role: Sponsor and primary advisor

Granting Agency: Boston University Undergraduate Research Opportunities Program

Title: Coordinated IMU-FES system to activate the ankle plantarflexors during poststroke walking
Period of Performance: 06/2017–08/2017
Undergraduate Fellow: Amogh Chandupatla
Role: Sponsor and primary advisor

PEER-REVIEWED PAPERS (Full-length Journal & Conference Papers)

Trainees indicated with "*". Senior investigators responsible for supervision and funding are <u>underlined</u>.

Published

51. Sloot LH*, Baker LM*, Bae J*, Porciuncula F*, Clement BF, Siviy C*, Nuckols RW, Baker TC*, Sloutsky RS*, Choe D*, ODonnell K, <u>Ellis TD</u>, **Awad LN**, <u>Walsh CJ</u>. Effects of a soft robotic exosuit on the quality and speed of long-distance walking depends on walking ability after stroke. Journal of Neuroengineering and Rehabilitation (Accepted)

50. Roto A*, Collimore AN*, Spangler J*, Braga-Ribeirinha L*, Hutchinson K, Wang QM, Thompson L, **Awad LN**. Enhancing neuroplasticity in the chronic phase after stroke: effects of a soft robotic exosuit on training intensity and brain-derived neurotrophic factor. IEEE Open Journal of Engineering and Rehabilitation. (Accepted)

49. Quirk DA*, Chung J*, Applegate M*, Cherin JM, <u>Dalton D</u>, **Awad LN**, <u>Walsh CJ</u>. Evaluating Adaptiveness of an Active Back Exosuit for Dynamic Lifting and Maximum Range of Motion. Ergonomics. 2023 Jul. DOI: 10.1080/00140139.2023.2240044

48. Swaminathan K*, Porciuncula F*, Park S*, Kannan H, Erard J, Wendel N*, Baker T*, <u>Ellis TD</u>, **Awad LN**, <u>Walsh CJ</u>. Ankle-targeted exosuit resistance increases paretic propulsion in people post-stroke. Journal of Neuroengineering and Rehabilitation. 2023. DOI: 10.1186/s12984-023-01204-w

47. Collimore AN*, Roto A*, Aiello A*, Sloutsky R*, Hutchinson K, Harris B, <u>Ellis TD</u>, **Awad LN**. Autonomous control of music to retrain walking after stroke. Neurorehabilitation and Neural Repair. 2023 Jun. DOI:10.1177/15459683231174223

46. Nuckols RW*, Chang CK*, Kim D*, Eckert-Erdheim A*, Orzel D, Baker L*, Baker T*, Wendel N*, Quinlivan B*, Murphy P*, Grupper J, Villalobos J, **Awad LN**, <u>Ellis TD</u>, <u>Walsh CJ</u>. Design and evaluation of an independent 4-week exosuit-assisted post-stroke community walking program. Annals of the New York Academy of Sciences. 2023 Apr. DOI: 10.1111/nyas.14998

45. Quirk AD*, Chung J*, Schiller G*, Cherin J, Arens P*, Sherman D*, Zeligson E*, <u>Dalton D</u>, **Awad LN**, <u>Walsh CJ</u>. Reducing back exertion and improving confidence of individuals with low back pain with a back exosuit: A feasibility study for use in BACPAC. Pain Medicine. 2023 Feb 16:pnad003.

44. **Awad LN**, Knarr B, Kudzia P*, Buchanan TS. The interplay between walking speed, economy, and stability after stroke. Journal of Neurologic Physical Therapy. 2023. Mar 3:10-97.

43. Siviy C*, Baker LM*, Quinlivan B*, Porciuncula F*, Swaminathan K*, **Awad LN**, <u>Walsh CJ</u>. Opportunities and challenges in the development of exoskeletons for locomotor assistance. Nature Biomedical Engineering. 2022. Dec 22;1-7.

42. Mitjans M*, Levine DM, **Awad LN**, <u>Tron R</u>. Koopman pose predictions for temporally consistent human walking estimations. In: Intelligent Robots and Systems, IEEE Int Conf on (IROS). 2022. Oct 23;5257-5264.

41. Swaminathan K*, Tolkova I*, Baker L*, Arumukhom Revi D*, **Awad LN**, <u>Walsh CJ</u>, <u>Mahadevan L</u>. A continuous statistical-geometric framework for normative and impaired gaits. Journal of the Royal Society Interface. 2022. 19: 20220402.

40. Sung Yul S*, Hohl K, *Gifforn M, **Awad LN**, <u>Walsh CJ</u>, <u>Jayaraman A</u>. Soft Robotic Exosuit Augmented High Intensity Gait Training on Stroke Survivors: A Pilot Study. Journal of Neuroengineering and Rehabilitation. 2022. Jun 3;19:51. PMID: 35655180

39. Swaminathan K*, Park SW*, Raza F*, Porciuncula F*, Lee S*, Nuckols RW, **Awad LN**, <u>Walsh CJ</u>. Ankle resistance with a unilateral exosuit facilitates ankle plantarflexor effort during pushoff in unimpaired individuals. Journal of Neuroengineering and Rehabilitation. 2021. Dec 27;18:182. PMID: 34961521

38. Revi DA*, De Rossi S, Walsh CJ, **Awad LN**. Estimation of walking speed and its spatiotemporal determinants using a single inertial sensor worn on the thigh: from healthy to hemiparetic walking.

Sensors. 2021. Oct:21:6976. PMID: 34770283

37. Porciuncula F*, Baker TC*, Arumukhom Revi D*, Bae J*, Sloutsky R*, Ellis TD, Walsh CJ, **Awad LN**. Targeting paretic propulsion and walking speed with a soft robotic exosuit: A consideration-of-concept trial. Frontiers in Neurorobotics. 2021. Jul 28;15:689577. PMID: 34393750

36. Collimore AN*, Aiello AJ*, Pohlig RT, **Awad LN**. The Dynamic Motor Control Index as a Marker of Age-Related Neuromuscular Impairment. Frontiers in Aging Neuroscience. 2021. Jul 22;13:678525. PMID: 34366824

35. Sloutsky R*, Yücel MA, Collimore AN*, Ottman E*, Ellis TD, Walsh CJ, Boas DA, **Awad LN**. Targeting post-stroke walking automaticity with a propulsion-augmenting soft robotic exosuit: toward a biomechanical and neurophysiological approach to assistance prescription. In: Neural Engineering, IEEE Int Conf on. 2021. DOI: 10.1109/NER49283.2021.9441244

34. Mitjans M*, Theofanidis M*, Collimore AN*, Disney ML*, Levine DM, **Awad LN**, Tron R. Visual-Inertial Filtering for Human Walking Quantification. In: Robotics and Automation (ICRA), IEEE Int Conf on. 2021. DOI: 10.1109/ICRA48506.2021.9561517

33. Luhmann AV, Zheng Y, Ortega-Martinez A, Kiran S, Somers DC, **Awad LN**, Ells TD, Boas DA, Yucel MA. Toward Neuroscience of the Everyday World (NEW) using functional Near Infrared Spectroscopy. Current Opinion in Biomedical Engineering. 2021. Jun;18:100272. PMID: 33709044

32. Arens P*, Siviy C*, Bae J*, Choe DK*, Karavas N, Baker T, Ellis TD, **Awad LN**, Walsh CJ. Real-time gait metric estimation for everyday gait training with wearable devices in people poststroke. Wearable Technologies. 2021 Mar;2:e2. PMID: 34396094

31. **Awad LN**, Lewek M, Kesar TM, Franz J, Bowden M. These legs were made for propulsion: Advancing the diagnosis and treatment of post-stroke propulsion deficits. Journal of NeuroEngineering and Rehabilitation. 2020. Oct.17:139. PMID: 33087137

30. Hutchinson K*, Sloutsky R*, Collimore A*, Farmer B*, Harris B, Ellis TD, **Awad LN**. A music-based digital therapeutic: Proof-of-concept automation of a progressive and individualized rhythm-based walking training program after stroke. Neurorehabilitation & Neural Repair. 2020 Oct. PMID: 33040685

29. Revi DA*, Alvarez A*, Walsh CJ, De Rossi S, **Awad LN**. Indirect measurement of anterior-posterior ground reaction forces using a minimal set of wearable inertial sensors: From healthy to hemiparetic walking. Journal of NeuroEngineering and Rehabilitation. 2020 Jun;17:82. PMID: 32600348

28. **Awad LN**, Esquenazi A, Francisco G, Nolan K, Jayaraman A. The ReWalk ReStore™ soft robotic exosuit: A multi-site clinical trial of the safety, reliability, and feasibility of exosuit-augmented post-stroke gait rehabilitation. Journal of NeuroEngineering and Rehabilitation. 2020;17:80. PMID: 32552775

27. Nuckols RW*, Swaminathan K*, Lee S*, **Awad LN**, Walsh CJ, Howe RD. Automated detection of soleus concentric contraction in variable gait conditions for improved exosuit control. In: Robotics and Automation (ICRA), IEEE Int Conf on. 2020. DOI: 10.1109/ICRA40945.2020.9197428

26. Park EJ*, Akbas T*, Eckert-Erdheim A, Sloot LH*, Orzel D, Schumm L, Ellis TD, **Awad LN**, Walsh CJ. A hinge-free, non-restrictive, lightweight tethered exosuit for knee extension assistance during walking. IEEE Transactions on Medical Robotics & Bionics. 2020 May;2:165-75. PMID: 33748694

25. Siviy C*, Bae J*, Baker L*, Porciuncula F*, Baker T, Ellis TD, **Awad LN**, Walsh CJ. Offline assistance optimization of a soft exosuit for augmenting ankle power of stroke survivors during walking. IEEE Robotics and Automation Letters. 2020 Apr;5:828-35. PMID: 33748413

24. **Awad LN**, Kudzia P*, Revi DA*, Ellis TD, Walsh CJ. Walking faster and farther with a soft robotic exosuit: Implications for post-stroke gait assistance and rehabilitation. IEEE Open Journal of Engineering in Medicine and Biology. 2020 Apr;1:108-15. PMID: 33748765

23. **Awad LN**, Hsiao H, Binder-Macleod SA. Central drive to the paretic ankle plantarflexors affects the relationship between propulsion and walking speed after stroke. Journal of Neurologic Physical Therapy. 2020;44:42-8. PMID: 31834220

22. **Awad LN**, Reisman DS, Binder-Macleod SA. Distance-induced changes in walking speed after stroke: Relationship to community walking activity. Journal of Neurologic Physical Therapy. 2019;43:220-223. PMID: 31449180

21. Porciuncula F*, Nuckols R*, Karavas N, Chang CK*, Baker TC, Orzel D, Perry D, Ellis TD, **Awad LN**, Walsh CJ. Assisting Limb Advancement During Walking After Stroke Using a Wearable Soft Hip

Exosuit: A Proof-of-Concept. In: Masia L, Micera S, Akay M, Pons J (eds). Biosystems and Biorobotics (21). Springer, Cham. 2019. DOI: 10.1007/978-3-030-01845-063

20. Porciuncula F*, Roto AV*, Kumar D, Davis I, Roy S, Walsh CJ, **Awad LN**. Wearable movement sensors for rehabilitation: A focused review of technological and clinical advances. Physical Medicine and Rehabilitation Journal. 2018 Sep;10S220-S232. PMID: 30269807

19. Bae J*, **Awad LN**, Long A, ODonnell K, Hendron K, Holt KG, Ellis TD, Walsh CJ. Biomechanical mechanisms underlying exosuit-induced improvements in walking economy after stroke. Journal of Experimental Biology. 2018 Jan 18; Pii:jeb.168815. PMID: 29361587

18. McNamara S*, Hevia E*, St. Louis R*, Cho W*, Lee S*, Moyne M, Quinlivan B*, Payne C*, Walsh C, Schiller G, **Awad LN**. Isometric quadriceps strength test device to improve the reliability of handheld dynamometry in patients with anterior cruciate ligament injury. In: Proceedings of the 2018 Design of Medical Devices Conference. American Society of Mechanical Engineers Digital Collection. 2018

17. Bae J*, Siviy C*, Rouleau M*, Menard N, O'Donnell K, Galiana I, Athanassiu M, Ryan D, Bibeau C, Sloot L*, Kudzia P*, Ellis TD, **Awad LN**, Walsh CJ. A lightweight and efficient portable soft exosuit for paretic ankle assistance in walking after stroke. In: Robotics and Automation (ICRA), IEEE Int Conf on. 2018. DOI: 10.1109/ICRA.2018.8461046

16. Kempski K*, **Awad LN**, Buchanan TS, Higginson J, Knarr BA. Dynamic structure of lower limb joint angles during walking post-stroke. Journal of Biomechanics. 2018 Feb 8;68:1-5. PMID: 29325901

15. **Awad LN**, Bae J, O'Donnell K, De Rossi SMM, Hendron K, Sloot LH, Kudzia S, Allen S, Holt KG, Ellis T, Walsh CJ. A soft robotic exosuit improves walking in patients after stroke. Science Translational Medicine. 2017 Jul. 26;9:eaa9084. PMID: 28747517

14. **Awad LN**, Bae J, Kudzia, P, Long A, Hendron K, Holt KG, O'Donnell K, Ellis TD, Walsh CJ. Reducing circumduction and hip hiking during hemiparetic walking through targeted assistance of the paretic limb using a soft robotic exosuit. American Journal of Physical Medicine and Rehabilitation. 2017 Oct. PMID: 28777105

13. **Awad LN**, Reisman DS, Pohlig RT, Binder-Macleod SA. Identifying candidates for targeted gait rehabilitation after stroke: better prediction through biomechanics-informed characterization. Journal of NeuroEngineering and Rehabilitation. 2016 Sep;13:84. PMID: 27663199.

12. Hsiao H, **Awad LN**, Palmer JA, Higginson JS, Binder-Macleod SA. Contribution of paretic and non-paretic limb peak propulsive forces to changes in walking speed in individuals poststroke. Neurorehabilitation & Neural Repair. 2016 Sep;30:743-52. PMID: 26721869.

11. **Awad LN**, Reisman DS, Pohlig RT, Binder-Macleod SA. Reducing the cost of transport and increasing walking distance after stroke: a randomized controlled trial on fast locomotor training combined with functional electrical stimulation. Neurorehabilitation & Neural Repair. 2016 Aug 30. PMID: 26621366.

10. Palmer JA, Hsiao H, **Awad LN**, Binder-Macleod SA. Symmetry of corticomotor input to plantarflexors influences the propulsive strategy used to increase walking speed post-stroke. Clinical Neurophysiology. 2016 Aug;30:661-70. PMID: 26724913.

9. Kesar TM, Reisman DS, Higginson JS, **Awad LN**, Binder-Macleod SA. Changes in Post-Stroke Gait Biomechanics Induced by One Session of Gait Training. Physical Medicine and Rehabilitation - International. 2015 Dec;2:1072. PMID: 2781906.

8. Bae J*, De Rossi SMM, ODonnell K, Hendron KL, **Awad LN**, Teles Dos Santos TR, De Araujo VL, Ding Y, Holt KG, Ellis TD, Walsh CJ. A soft exosuit for patients with stroke: Feasibility study with a mobile off-board actuation unit. In: Rehabilitation Robotics (ICORR), IEEE Int Conf on. 2015.

7. **Awad LN**, Binder-Macleod SA, Pohlig RT, Reisman DS. Paretic propulsion and trailing limb angle are key determinants of long-distance walking function after stroke. Neurorehabilitation and Neural Repair. 2015 Jul;29:499-508. PMID: 25385764.

6. **Awad LN**, Palmer JA, Pohlig RT, Binder-Macleod SA, Reisman DS. Walking speed and step length asymmetry modify the energy cost of walking after stroke. Neurorehabilitation and Neural Repair. 2015 Jun;29:416-23. PMID: 25288581.

5. **Awad LN**, Reisman DS, Wright TR, Roos M, Binder-Macleod SA. Maximum walking speed is a key determinant of long distance walking function after stroke. Topics in Stroke Rehabilitation. 2014 Nov-Dec;21:502-9. PMID: 25467398.

4. **Awad LN**, <u>Reisman DS</u>, <u>Binder-Macleod SA</u>. Do improvements in balance relate to improvements in long-distance walking function after stroke? Stroke Research and Treatment. 2014. PMID: 25120939.

3. **Awad LN**, <u>Reisman DS</u>, Kesar TM, <u>Binder-Macleod SA</u>. Targeting paretic propulsion to improve post-stroke walking function: a preliminary study. Archives of Physical Medicine and Rehabilitation. 2014 May;95:840-8. PMID: 24378803.

2. **Awad LN**, <u>Kesar TM</u>, Reisman D, <u>Binder-Macleod SA</u>. Effects of repeated treadmill testing and electrical stimulation on post-stroke gait kinematics. Gait and Posture. 2013 Jan;37:67-71. PMID: 22796242.

1. Hanna JJ, **Awad LN**, Paskhover B. The second-class disease: Pediatric cancer. Einstein Journal of Biology and Medicine. 2011;27:18-19.

PEER-REVIEWED EXTENDED ABSTRACTS (1 to 2 pages)

13. Arumukhom Revi D*, Spangler J*, De Rossi MM S, Swift WL*, Ribeirinha-Braga L*, Ellis TD, Walsh CJ, **Awad LN**. Wearable sensors reveal propulsion-based locomotor phenotypes among endurant individuals after stroke. In: Proceedings of the North American Congress on Biomechanics. 2022.

12. Roto AV*, Spangler J*, Braga-Ribeirinha L*, Hutchinson K, **Awad LN**. Soft robotic exosuit assistance facilitates high intensity gait training after stroke. In: Proceedings of the North American Congress on Biomechanics. 2022.

11. Collimore AN*, Pohlig R, **Awad LN**. Minimum Viable Muscle Set for Identifying Impairments in the Neuromuscular Control of Walking Using the Dynamic Motor Control Index. In: Proceedings of the North American Congress on Biomechanics. 2022.

10. Collimore AN*, Roto AV*, Hutchinson K, Harris B, **Awad LN**. Rhythmic Auditory Stimulation improves cost of transport and asymmetry after stroke. In: Proceedings of the American Society of Biomechanics. 2021.

9. Nuckols R*, Porciuncula F*, Chang CK*, Baker TC, Orzel D, Eckert-Erdehim A, Perry D, <u>Ellis T</u>, **Awad LN**, <u>Walsh C</u>. Mobile unilateral hip flexion exosuit assistance for overground walking in individuals post-stroke: A case series. In: Converging Clinical & Engineering Research in Neurorehabilitation. 2020.

8. Arumukhom Revi DA*, Alvarez AM*, Braga LR*, Walsh CJ, De Rossi SMM, **Awad LN**. Beyond walking distance: Evaluating propulsion function during the 6-minute walk test with wearable inertial sensors. In: Proceedings of the American Society of Biomechanics. 2020.

7. Alvarez AM*, Collimore AN*, Aiello AJM*, Binder-Macleoad SA, **Awad LN**. Propulsion timing affects the relationship between paretic propulsion and long-distance walking function after stroke. In: Proceedings of the American Society of Biomechanics. 2020.

6. Sloot L*, Bae J*, Baker L*, O'Donnell K, Menard N, Porciuncula F*, Choe D*, <u>Ellis T</u>, **Awad LN**, <u>Walsh CJ</u>. A soft robotic exosuit assisting the paretic ankle in patients post-stroke: Effect on muscle activation during overground walking. Gait and Posture. 2018.

5. **Awad LN**, Bae J*, O'Donnell K, Hendron KL*, Sloot L*, Siviy C*, Kudzia P*, <u>Ellis TD</u>, <u>Walsh CJ</u>. Soft exosuits increase walking speed and distance after stroke. In: 2017 International Symposium on Wearable Robotics and Rehabilitation (WeRob). IEEE. 2017.

4. Bae J*, **Awad LN**, Menard N, Rouleau M*, Siviy C*, O'Donnell K, <u>Ellis TD</u>, <u>Walsh CJ.</u> Exosuit-induced improvements in walking after stroke: comprehensive analysis on gait energetics and biomechanics. In: 2017 International Symposium on Wearable Robotics and Rehabilitation (WeRob). IEEE. 2017.

3. Kudzia P*, Bae J*, **Awad LN**, Long A*, Sloot LH*, Hendron K, Holt KG, O'Donnell K, <u>Ellis TD</u>, <u>Walsh CJ</u>. A uni-lateral soft exosuit for the paretic ankle can reduce gait compensations in patients post-stroke. In: Proceedings of the American Society of Biomechanics. 2017.

2. Sloot L*, Hejrati B*, Kudzia P*, Bae J*, Hendron K*, O'Donnell K, Holt KG, <u>Ellis TD</u>, **Awad LN**, <u>Walsh CJ</u>. A uni-lateral ankle assisting soft robotic exosuit can improve post-stroke gait during overground walking. In: Proceedings of the American Society of Biomechanics. 2017.

1. Bae J*, **Awad LN**, O'Donnell K, Hendron KL, Allen S, De Rossi SMM, Holt KG, <u>Ellis TD</u>, <u>Walsh CJ</u>. Assisting paretic ankle motion with a soft exosuit can reduce whole-body compensatory gait patterns and improve walking efficiency for patients after stroke. In: Dynamic Walking. 2016.

BOOK CHAPTERS

1. Walsh CJ, **Awad LN**. From Traditional Anklebots to Soft Exosuits for Restoration of Walking for Individuals Post-Stroke. In: *Reinkensmeyer DJ, Marchal-Crespo L, Dietz V (eds). Neurorehabilitation Technology*. Springer Publishing. 2022

2. **Awad LN**, Walsh CJ, Malcolm P. Soft Wearable Robots. In: *Wang Q, Vitiello N, Hasegawa Y (eds). Wearable Robotics for Motion Assistance and Rehabilitation*. Springer Publishing. (In Press)

PRESENTATIONS (Organized, Contributed, and Invited)

National Conference *Organized* Educational Sessions

149. **Awad LN**, Nolan K, Harris B. (EDUCATIONAL SESSION). Overcoming the Efficacy and Access Gaps in Chronic Stroke Rehabilitation: Development and Translation of an Autonomous Neurorehabilitation System Based on Rhythmic Auditory Stimulation. American Congress of Rehabilitation Medicine. Atlanta, GA. 2023 (ACCEPTED)

148. Brown LE, Johnston TE, **Awad LN**, Cornforth ED, Dibello S. (WORKSHOP) Swing into Action: Applying the Clinical Practice Guideline on AFO and FES Poststroke into Practice. Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

147. **Awad LN**, Harris B, Bethoux F, Ellis T. (EDUCATIONAL SESSION). Bridging Care Gaps with Music-Based Digital Interventions: Evidence in Stroke, Multiple Sclerosis, and Parkinson Disease. Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

146. **Awad LN**, Harris B, Bethoux F, Ellis T. (EDUCATIONAL SESSION). Bridging Care Gaps with Music-Based Digital Interventions: Evidence in Stroke, Multiple Sclerosis, and Parkinson Disease. Annual Meeting of the American Congress on Rehabilitation Medicine. Chicago, IL. 2022

145. **Awad LN**, Harris B, Spaulding A. (EDUCATIONAL SESSION) Rhythm & the motor system: New opportunities for gait training. Annual Meeting of the American Congress on Rehabilitation Medicine. Virtual. 2021

144. Hornby G, **Awad LN**, Hohl K, Packel A. (EDUCATIONAL SESSION) High Intensity Locomotor Training and Robotics: Friend or Foe? Annual Meeting of the American Congress on Rehabilitation Medicine. Virtual. 2021

143. **Awad LN**, Lewek M, Ellis T, Spaulding A, Harris B. (EDUCATIONAL SESSION) Rhythm and the motor system: New opportunities for gait training. Combined Sections Meeting of the American Physical Therapy Association. Denver, CO. 2020

142. **Awad LN**, Harris B, Spaulding A. (EDUCATIONAL SESSION) Rhythm & the motor system: New opportunities for gait training. Training Institute of the American Congress on Rehabilitation Medicine. Chicago, IL. 2019

141. **Awad LN**, Lewek M, Finley J, Kesar TM, Thompson LV. (EDUCATIONAL SESSION) Treating gait asymmetry after stroke: Basic and clinical research insights. Combined Sections Meeting of the American Physical Therapy Association. Washington, DC. 2019

140. **Awad LN**, Harris B, Spaulding A. (WORKSHOP) Rhythm & the Motor System: New Opportunities for Gait Training. Annual Meeting of the American Congress on Rehabilitation Medicine. Dallas, TX. 2018

139. **Awad LN**, Bowden M, Lewek M, Franz J. (EDUCATIONAL SESSION) Diagnosing and Treating Deficits in Propulsion to Improve Walking After Stroke. Combined Sections Meeting of the American Physical Therapy Association. New Orleans, LA. 2018

138. **Awad LN**, Bowden M, Lewek M, Franz J. (EDUCATIONAL SESSION) Diagnosing and Treating Deficits in Propulsion to Improve Walking After Stroke: Clinical and Technological Advances. Annual Meeting of the American Congress on Rehabilitation Medicine. Atlanta, GA. 2017

137. Eng Lo, **Awad LN**. (EDUCATIONAL SESSION) Engineering for Stroke Science. International Stroke Conference of the American Heart Association. Houston, TX. 2017

136. Joel Stein, **Awad LN**. (EDUCATIONAL SESSION) New Frontiers in Rehabilitation Robotics. Annual Meeting of the Association of Academic Physiatrists. Las Vegas, NV. 2017

National Conference *Contributed* Presentations

135. Smayda K, Taylor S, **Awad LN**. Pivotal trial of InTandem, a neurorehabilitation system using auditory-motor entrainment to improve chronic stroke walking. Combined Sections Meeting of the American

Physical Therapy Association. Boston, MA. 2024 (submitted)

134. Porciuncula F*, Arumukhom Revi D*, Spangler J*, Baker TC*, Cataldo AR*, Collimore A*, Kiley S*, Leonardo A*, Sloutsky R*, Bonato P, Breen J, Walsh CJ, Ellis TD, **Awad LN**. Durable improvements in post-stroke walking speed and 6-minute walk test distance following high-intensity gait training with soft robotic exosuits. Combined Sections Meeting of the American Physical Therapy Association. Boston, MA. 2024 (submitted)

133. Spangler J*, Mitjans M*, Collimore A*, Gomes A*, Levine D, Tron R, **Awad LN**. A multimodal, inertial-visual sensing system for automated functional assessments in the home. Combined Sections Meeting of the American Physical Therapy Association. Boston, MA. 2024 (submitted)

132. Hutchinson KJ, Lewis CL, Smayda K, Harris B, **Awad LN**. Can cadence be used to predict activity intensity walking post-stroke? Combined Sections Meeting of the American Physical Therapy Association. Boston, MA. 2024 (submitted)

131. Sloutsky R*, Rose A*, Yücel MA, Ellis TD, Walsh CJ, Boas D, **Awad LN**. Effects of a propulsion-augmenting soft robotic exosuit on walking automaticity after stroke. Combined Sections Meeting of the American Physical Therapy Association. Boston, MA. 2024 (submitted)

130. Porciuncula F*, Zajac J*, Wendel N, Baker TC, Arumukhom Revi D*, Girnis J*, **Awad LN**, Cavanaugh JT, Ellis TD. Relationship between habit strength of walking-related exercise and real-world walking in persons with Parkinson disease. Combined Sections Meeting of the American Physical Therapy Association. Boston, MA. 2024 (submitted)

129. Bethoux F, **Awad LN**, Gallagher L, Harris B, Taylor S, Xiao H, Linder S. Safety and acceptability of closed-loop rhythmic cueing for gait training in persons with mulitple sclerosis: a pilot single-blind randomized controlled trial. MSMilan 9th Joint ECTRIMIS-ACTRIMIS Meeting. 2023. Milan, Italy.

128. Collimore AN*, Alvarez JT*, Sherman DA*, Binder-Macleod SA, Walsh CJ, **Awad LN**. Plantarflexor central drive is associated with poststroke walking function. (PLATFORM)American Society of Biomechanics Annual Meeting. Knoxville, Tennessee. 2023

127. Porciuncula F*, Zajac J*, Cavanaugh J, McGregor C, Girnis J, **Awad LN**, Harris B, Pantelyat A, Ellis TD. Feasibility of a community-based walking program using autonomous rhythmic auditory stimulation in persons with Parkinson disease. 6th World Parkinson Congress. 2023. Barcelona, Spain.

126. Porciuncula F*, Zajac J*, Cavanaugh J, McGregor C, Girnis J, **Awad LN**, Harris B, Pantelyat A, Ellis TD. Real-world effects of autonomous rhythmic auditory stimulation on walking speed modulation in persons with Parkinson disease. 6th World Parkinson Congress. Barcelona, Spain. 2023

125. Collimore A*, Alvarez J*, Barrow N*, Sherman DA*, Binder-Macleod SA, Walsh CJ, **Awad LN**. Accuracy of a portable device for measuring plantarflexor muscle strength and central drive. (POSTER) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

124. Aiello A*, Choe D*, Spangler J*, Deming L*, Walsh CJ, **Awad LN**. Towards precision rehabilitation of post-stroke speed and propulsion using a wearable functional electrical stimulation platform. (POSTER) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

123. Roto A*, Sloutsky R*, Spangler J*, Ribeirinha-Braga L*, Porciuncula F*, Hutchinson K, **Awad LN**. Enhancing neuroplasticity in the chronic phase after stroke: effects of a soft robotic exosuit on brain-derived neurotrophic factor. (POSTER) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

122. Arumukhom Revi D*, Spangler J*, De Rossi S, Swift W*, Ribeirinha-Braga L*, Walsh CJ, Ellis TD, **Awad LN**. Propulsion asymmetry is associated with an inefficient compensatory ankle-to-hip redistribution of positive power after stroke. (PLATFORM) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

121. Hutchinson KJ*, Swift W*, Smayda K*, Harris B, **Awad LN**. High intensity walking training is achieved post-stroke using digitally-delivered automated, music-based rhythmic auditory stimulation. (POSTER) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

120. Porciuncula F*, Arumukhom Revi D*, Baker TC*, Spangler J*, Collimore AN*, Ribeirinha-Braga L*, Roto A*, Sloutsky R*, Bonato P, Breen J, Ellis TD, Walsh CJ, **Awad LN**. Walking faster with soft robotic exosuits: A responder analysis of exosuit-augmented walking speed after stroke. (PLATFORM) Combined Sections Meeting of the American Physical Therapy Association. San Diego, CA. 2023

119. Arumukhom Revi D*, Spangler J*, De Rossi MM S, Swift WL*, Ribeirinha-Braga L*, Ellis TD, Walsh CJ,

Awad LN. Wearable sensors reveal propulsion-based locomotor phenotypes among endurant individuals after stroke. (PLATFORM) North American Congress on Biomechanics. Ottawa, Canada. 2022

118. Roto AV*, Spangler J*, Braga-Ribeirinha L*, Hutchinson K, **Awad LN**. Soft robotic exosuit assistance facilitates high intensity gait training after stroke. (PLATFORM) North American Congress on Biomechanics. Ottawa, Canada. 2022

117. Collimore AN*, Pohlig R, **Awad LN**. Minimum Viable Muscle Set for Identifying Impairments in the Neuromuscular Control of Walking Using the Dynamic Motor Control Index. (POSTER) North American Congress on Biomechanics. Ottawa, Canada. 2022

116. Porciuncula F*, Arumukhom Revi D*, Baket TC*, Bae J*, Sloutsky R*, Spangler J*, Baker L*, Ribeirinha-Braga L, Ells TD, Walsh CJ, **Awad LN**. Restoring propulsion after stroke through high-intensity gait training with soft robotic exosuits: A development-of-concept trial. (POSTER) APTA Academy on Research Retreat. Beverly, MA. 2022

115. Collimore A*, Pohlig R, **Awad LN**. Identifying age-related changes in the neuromuscular control of walking using reduced muscle sets. (PLATFORM) World Congress of Biomechanics. Virtual. 2022

114. Arumukhom Revi D*, Spangler J*, De Rossi S, Swift W*, Braga LR*, Ellis TD, Walsh CJ, **Awad LN**. Initial propulsion asymmetry is associated with differences in perceived exertion and the spatiotemporal strategy used to maintain speed over long distances in people post-stroke. (PLATFORM) World Congress of Biomechanics. Virtual. 2022

113. Swaminathan K*, Park S*, Porciuncula F*, **Awad LN**, Walsh CJ. Targeted plantarflexion resistance using a soft ankle exosuit increases paretic propulsion in people poststroke. (PLATFORM) World Congress of Biomechanics. Virtual. 2022

112. **Awad LN**, Harris B. A music-based digital therapeutic improves walking speed after stroke: A *consideration-of-concept* trial. (POSTER) International Stroke Conference. Virtual. 2022

111. Aiello A*, Choe D*, Spangler J*, Shih B*, Walsh CJ, **Awad LN**. Overground gait training with a plantarflexor neuroprosthesis increases walking speed and paretic propulsion after stroke. (POSTER) Combined Sections Meeting, American Physical Therapy Association. Virtual. 2022

110. Arumukhom Revi D*, Spangler J*, De Rossi S, Swift W*, Walsh CJ, **Awad LN**. Characterizing post-stroke impairments in propulsion and speed using an inertial sensor worn on the thigh. (POSTER) Combined Sections Meeting, American Physical Therapy Association. Virtual. 2022

109. Sloutsky R*, Revi DA*, Rogers D*, Spangler J*, Yucel M, Ellis TD, Walsh CJ, Boas DA, **Awad LN**. Methodology for using functional near-infrared spectroscopy to characterize effects of gait interventions on walking automaticity. (POSTER) Combined Sections Meeting, American Physical Therapy Association. Virtual. 2022

108. Sloutsky R*, Yücel MA, Collimore AN*, Ottman E*, Ellis TD, Walsh CJ, Boas DA, **Awad LN**. Targeting post-stroke walking automaticity with a propulsion-augmenting soft robotic exosuit: toward a biomechanical and neurophysiological approach to assistance prescription. (PLATFORM) 10th International IEEE/EMBS Conference on Neural Engineering (NER). Virtual. 2021

107. Mitjans M*, Theofanidis M*, Collimore AN*, Disney ML*, Levine DM, **Awad LN**, Tron R. Visual-Inertial Filtering for Human Walking Quantification. (PLATFORM) IEEE Conference on Robotics and Automation (ICRA). Virtual. 2021

106. Collimore AN*, Roto AV*, Hutchinson K, Harris B, **Awad LN**. (PLATFORM) Rhythmic Auditory Stimulation improves cost of transport and asymmetry after stroke. American Society of Biomechanics Annual Meeting. Virtual. 2021.

105. Collimore AN*, Aiello AJ*, Pohlig RT, **Awad LN**. (POSTER) The dynamic motor control index is a better marker of age-related neuromotor impairments than the number of muscle synergies. Neural Control of Movement. Virtual. 2021

104. Swaminathan K*, Park S*, Porciuncula F*, Fouzia R, **Awad LN**, Walsh CJ. (POSTER) Preliminary Evidence for Short-term Retention of Increased Paretic Propulsion after Intermittent Exosuit Assistance in People Post-Stroke with Moderate Propulsion Deficit. Neural Control of Movement. Virtual. 2021

103. Sloutsky R*, Yücel MA, Ottman E, Ellis TD, Walsh CJ, Boas DA, **Awad LN**. (POSTER) Toward individualized and outcome-specific prescriptions of paretic plantarflexor assistance parameters during soft robotic exosuit-augmented locomotion. Combined Sections Meeting, American Physical Therapy Association. Virtual. 2021

102. Porciuncula F*, Revi DA, Baker TC, Bae J, Sloutsky R, Baker LM, Ellis TD, Walsh CJ, **Awad LN**. (POSTER) Speed-Based Gait Training with Soft Robotic Exosuits Improves Walking after Stroke: A Crossover Pilot Study. Combined Sections Meeting of the American Physical Therapy Association. Virtual. 2021

101. Roto AV*, Sloutsky R, Starr JA, **Awad LN**. From Heart Rate to VO2: Estimation equation for post-stroke hemiparetic walking across different training intensities. (PLATFORM) Combined Sections Meeting of the American Physical Therapy Association. Virtual. 2021

100. Revi DA*, Braga LR, Alvarez AM, Walsh CJ, De Rossi SMM, **Awad LN**. (PLATFORM) Evaluating post-stroke paretic propulsion function during the 6-mintue walk test with wearable inertial sensors. Combined Sections Meeting of the American Physical Therapy Association. Virtual. 2021

99. Butler J, O'Donnell K, **Awad LN**. (POSTER) The ReStore exosuit is a safe addition to physical therapy treatment to improve walking outcomes post-stroke. Annual Meeting of the American Congress on Rehabilitation Medicine. Virtual. 2020

98. Harris B, **Awad LN**. (POSTER) Automating a progressive and individualized rhythm-based walking training program after stroke: Feasibility of a music-based digital therapeutic. Annual Meeting of the American Congress on Rehabilitation Medicine. Virtual. 2020

97. Revi DA*, Alvarez AM, Braga LR, Walsh CJ, De Rossi SMM, **Awad LN**. (POSTER) Beyond walking distance: Evaluating propulsion function during the 6-minute walk test with wearable inertial sensors. American Society of Biomechanics Annual Meeting. Virtual. 2020

96. Alvarez AM*, Collimore AN, Aiello AJM, Binder-Macleoad SA, **Awad LN**. (POSTER) Propulsion timing affects the relationship between paretic propulsion and long-distance walking function after stroke. American Society of Biomechanics Annual Meeting. Virtual. 2020

95. O'Connor MV*, Roto AV, Aiello AJ, Collimore AN, Sloutsky R, Harris B, **Awad LN**. (POSTER) Targeting Rhythm to Improve Economy: One Session of Music-Based Rhythmic Locomotor Training Improves Post-Stroke Economy. Combined Sections Meeting of the American Physical Therapy Association. Denver, CO. 2020

94. Hutchinson KJ, Farmer B*, Sloutsky R*, Harris B, Ellis TD, **Awad LN**. (POSTER) Closing the Loop on Rhythm: Automated, Progressive, and Music-Based Rhythmic Training Increases Post-Stroke Gait Speed. Combined Sections Meeting of the American Physical Therapy Association. Denver, CO. 2020

93. Porciuncula F*, Baker TC*, Revi DA*, Bae J*, Sloutsky R*, Baker L*, Ellis T, Walsh CJ, **Awad LN**. (POSTER) Soft Robotic Exosuits for Targeted Gait Rehabilitation After Stroke: A Case Study. American Society for Neurorehabilitation. Chicago, IL. 2019

92. Ledwick CW*, Roto A*, Binder-Macleod SA, **Awad LN**. (PLATFORM) Relationship between poststroke depression and self-perception, physical abilities, and physical activity. Combined Sections Meeting of the American Physical Therapy Association. Washington, DC. 2019

91. Paskewitz JS*, Alvarez A*, Binder-Macleod SA, **Awad LN**. (POSTER) Identifying paretic propulsion and ground clearance impairments after stroke through the combined assessment of walking speed and specific functional gait assessment items. Combined Sections Meeting of the American Physical Therapy Association. Washington, DC. 2019

90. Porciuncula F*, Nuckols R, Karavas N, Chang CK, Baker TC, Orzel D, Perry D, Ellis T, **Awad LN**, Walsh CJ. (PLATFORM) Assisting limb advancement during walking in stroke using a wearable soft hip exosuit: A proof-of-concept. International Conference on Neurorehabilitation. Pisa, Italy. 2018.

89. **Awad LN**, Knarr B, Kudzia P, Buchanan T. (POSTER) Speed-based changes to walking stability and economy may explain preferred walking speed after stroke. World Congress of Biomechanics. Dublin, Ireland. 2018.

88. Sloot L*, Bae J, Nuckols R, Baker L, O'Donnell K, Menard N, Porciuncula F, Sloutsky R, Baker T, Choe D, Ellis T, **Awad LN**, Walsh C. (PLATFORM) Soft robotic exosuit assisting patients post-stroke: effect on muscle activation during overground walking. World Congress of Biomechanics. Dublin, Ireland. 2018.

87. McNamara S*, Hevia EG, Lee S, St. Louis R, Cho W, Payne CJ, Moyne M, Quinlivan B, Schiller G, **Awad LN**, Walsh CJ. (POSTER) Isometric quadriceps strength test device to improve the reliability of handheld dynamometry in patients with anterior cruciate ligament injury. ASME Design of Medical Devices Conferences. Minneapolis, MN. 2018.

86. Bae J*, Siviy C, Rouleau M, Menard N, ODonnell K, Galiana I, Athanassiu M, Ryan D, Sloot L, Kudzia P, Ellis TD, **Awad LN**, Walsh CJ. (PLATFORM) Portable soft exosuit for paretic ankle assistance in overground walking after stroke. Dynamic Walking. Pensacola, FL. 2018.

85. **Awad LN**, Binder-Macleod S. (PLATFORM) Contribution of impairments in paretic plantarflexor force capacity, volitional strength, and activation to paretic propulsion during hemiparetic walking. American Physical Therapy Association Combined Sections Meeting. New Orleans, LA. 2018

84. Bae J*, Siviy C, Rouleau M, Menard N, ODonnell K, Galiana I, Athanassiu M, Ryan D, Bibeau C, Sloot L, Kudzia P, Ellis TD, **Awad LN**, Walsh CJ. (PLATFORM) A lightweight and efficient portable soft exosuit for paretic ankle assistance in walking after stroke. IEEE International Conference on Robotics and Automation (ICRA). Brisbane, Australia. 2018

83. **Awad LN**, Bae J, O'Donnell K, Hendron K, Sloot L, Siviy C, Kudzia P, Ellis TD, Walsh CJ. (POSTER) Soft Exosuits Increase Walking Speed and Distance after Stroke. IEEE International Symposium on Wearable Robotics and Rehabilitation (WeRob). Houston, TX. Nov 2017

82. Bae J*, **Awad LN**, Siviy C, ODonnell K, Ellis TD, Walsh CJ. (POSTER) Exosuit-Induced Improvements in Walking after Stroke: Comprehensive Analysis of Gait Energetics And Biomechanics. IEEE International Symposium on Wearable Robotics and Rehabilitation (WeRob). Houston, TX. Nov 2017

81. Kudzia P*, Bae J, **Awad LN**, Long A, Sloot L, Hendron K, Holt KG, ODonnell K, Ellis T, Walsh CJ. (POSTER) A Unilateral Soft Exosuit for the Paretic Ankle can Reduce Gait Compensations in Patients Poststroke. American Society of Biomechanics Annual Meeting. Boulder, CO. Aug 2017

80. Sloot LH*, Hejrati B, Kudzia P, Bae J, Hendron K, ODonnell K, Ellis T, **Awad LN**, Walsh CJ. (POSTER) A Unilateral Ankle Assisting Soft Robotic Exosuit can Improve Post-Stroke Gait during Overground Walking. American Society of Biomechanics Annual Meeting. Boulder, CO. Aug 2017.

79. **Awad LN**, Reisman DS, Binder-Macleod SA. (PLATFORM) Identifying Candidates for Targeted Gait Rehabilitation: Better Prediction through Biomechanics-Informed Characterization. American Physical Therapy Association Combined Sections Meeting. San Antonio, TX. Feb 2017

78. **Awad LN**, Bae J, ODonnell K, Hendron KL, Kudzia P, Zurawski E, Holt KG, Ellis TD, Walsh CJ. (POSTER) Soft Wearable Robots Can Increase Walking Speed and Distance after Stroke: Proof-of-Concept. American Physical Therapy Association Combined Sections Meeting. San Antonio, TX. February 2017

77. Bae J*, **Awad LN**, ODonnell K, Hendron KL, Allen S, De Rossi SMM, Holt KG, Ellis TD, Walsh CJ. (PLATFORM) Assisting Paretic Ankle Motion with a Soft Exosuit Can Reduce Compensatory Gait Patterns and Improve Walking Efficiency For Patients After Stroke. Dynamic Walking. Camp Ohiyesa, MI. June 2016

76. **Awad LN**, Bae J, De Rossi S, ODonnell K, Hendron K, Allen S, Holt K, Ellis T, Walsh C. (PLATFORM) Improving Poststroke Walking with a Soft Exosuit: A Potential Platform for Community-Based Neurorehabilitation. World Congress for Neurorehabilitation. Philadelphia, PA. May 2016

75. **Awad LN**, Bae J, ODonnell K, Hendron KL, Allen S, De Rossi SMM, Holt KG, Ellis TD, Walsh CJ. (PLATFORM) Soft Wearable Robots Can Reduce the Energy Cost of Poststroke Walking: A Proof-of-Concept Study. American Physical Therapy Association Combined Sections Meeting. Anaheim, CA. February 2016

74. Palmer JA, Hsiao H, **Awad LN**, Binder-Macleod SA. (POSTER) Asymmetrical Corticomotor Input to the Plantarflexors Influences the Biomechanical Strategy of Speed Modulation in Individuals Post-stroke. Society for Neuroscience Annual Meeting. Chicago, IL. 2015

73. Bae J, De Rossi SMM, **Awad LN**, ODonnell K, Holt KG, Ellis TD, Walsh CJ. (POSTER) Human-Machine Interaction with Mobility Enhancing Soft Exosuits. NSF Cyber-Physical Systems Principal Investigators Meeting. Arlington, VA. 2015

72. Bae J, De Rossi SMM, ODonnell K, Hendron KL, **Awad LN**, Teles Dos Santos TR, De Araujo VL, Ding Y, Holt KG, Ellis TD, Walsh CJ. (PLATFORM) Soft Exosuit for Poststroke Gait Assistance. IEEE International Conference on Rehabilitation Robotics (ICORR). Singapore. 2015

71. **Awad LN**, Reisman DS, Binder-Macleod SA. (PLATFORM) Initial Results from the FastFES Randomized Controlled Trial. American Physical Therapy Association Combined Sections Meeting. Indianapolis, IN. 2015

70. **Awad LN**, Reisman DS, Binder-Macleod SA. (POSTER) Walking Speed Does Not Tell All After Stroke.

American Physical Therapy Association Combined Sections Meeting. Indianapolis, IN. 2015

69. **Awad LN**, Binder-Macleod SA, Pohlig RT, Reisman DS. (PLATFORM) Paretic propulsion and trailing limb angle are key determinants of long-distance walking function after stroke. Gait and Clinical Movement Analysis Society Annual Meeting. Newark, DE. 2014

68. Knarr B, **Awad LN**, Reisman D. (PLATFORM) Training with real-time visual feedback of propulsion in poststroke individuals: case study. Gait & Clinical Movement Analysis Society. Newark, DE. 2014

67. **Awad LN**, Reisman DS, Wright TR, Binder-Macleod SA. (POSTER) Identifying deficits to target during post-stroke walking rehabilitation. American Physical Therapy Association Combined Sections Meeting. Las Vegas, NV. 2014

66. Brandis C, **Awad LN**, Hsiao H, Marion S, Kesar TM, Binder-Macleod SA. (PLATFORM) The Effects of Fatigue on Poststroke Muscle Force Production and Center of Mass Acceleration: A Musculoskeletal Simulation Analysis. 11th International Symposium, Computer Methods in Biomechanics and Biomedical Engineering. Salt Lake City, UT. 2013

65. **Awad LN**, Kesar TM, Binder-Macleod SA. (POSTER) How many training sessions are necessary to obtain an accurate assessment of gait performance in individuals post-stroke? American Physical Therapy Association Combined Sections Meeting, New Orleans, LA. 2011

Regional Conference *Contributed* Presentations

64. Collimore AN*, Aiello AJ*, **Awad LN**. Complexity of neuromuscular control is impaired with aging and associated with reduced central drive to the paretic plantarflexor muscles after stroke: A preliminary study. (POSTER) NeuroBoston. 2020.

63. Lansberry G*, Walsh C, **Awad LN**. reNeu: A neuroprosthesis for gait restoration after stroke. (PLATFORM) Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2019

62. Aiello A*, Choe D, Sloutsky R, Lansberry G, Walsh C, **Awad LN**. reNeu: neuroprosthesis for improving post-stroke gait. (POSTER) Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2019

61. Porciuncula F*, Baker TC, Sloutsky R, Ellis T, **Awad LN**. (SESSION) May the (propulsion) force be with you: Soft robotic exosuits for gait restoration after stroke. APTA-MA Annual Conference. Norwood, MA. 2019

60. Lansberry G*, Aiello A, Walsh T, Bonato P, Walsh C, **Awad LN**. Bio-machine integration of functional electrical stimulation and exosuits: Lighter, smaller, and more powerful soft wearable robots. (POSTER). Annual Retreat of the Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2018

59. Porciuncula F*, Baker T, Sloutsky R, Revi D, Baker L, Ellis TD, Walsh CJ, **Awad LN**. Robotic Exosuit Augmented Locomotion (REAL): Personalized, gait-restorative training in the community. (POSTER). Annual Retreat of the Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2018

58. Doolan F*, Binder-Macleod S, **Awad LN**. Paretic Plantarflexor Muscle Function After Stroke: Impairments in Activation, not Capacity, Contribute to Deficits in Paretic Propulsion During Hemiparetic Walking. (POSTER) Boston University Annual Translational Science Symposium. Boston, MA. 2017

57. **Awad LN**, Reisman DS, Binder-Macleod SA. FastFES Targeted Locomotor Training After Stroke. (POSTER) Spaulding Stroke Institute and New England Regional Coordination Center Stroke Recovery Research Symposium. Charlestown, MA. 2016

56. Bae J*, **Awad LN**, ODonnell K, Hejrati B, Long A, Sloot L, Walsh CJ. Soft Exosuit for Gait Recovery After Stroke: Feasibility Study with Chronic Stroke Patients. (POSTER) Spaulding Stroke Institute Stroke Recovery Research Symposium. Charlestown, MA. 2016

55. O'Donnell K*, Bae J, **Awad LN**, Hendron K, Kudzia P, Long A, Sloot L, Hejrati B*, Holt KG, Ellis T, Walsh CJ. Soft Medical Exosuits for Gait Rehabilitation: From the Lab to the Clinic. (PLATFORM) Annual Retreat of the Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2016

54. Bae J*, ODonnell K, **Awad LN**, Hendron K, Kudzia P, Long A, Sloot L, Hejrati B, Holt KG, Ellis T, Walsh CJ. Soft Exosuit for Poststroke Gait Assistance. (POSTER) Annual Retreat of the Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2016

53. O'Donnell K*, **Awad LN**, Bae J, Menard N, Wong T, De Rossi SMM, Willis C, Hendron K, Holt KG, Ellis T, Walsh CJ. Soft Medical Exosuits for Gait Assistance. (PLATFORM) Annual Retreat of the Wyss Institute for Biologically Inspired Engineering. Boston, MA. 2015

52. **Awad LN**, Palmer J, Binder-Macleod SA, Pohlig RT, Reisman DS. Walking Speed and Step Length

Asymmetry Modify Walking Economy After Stroke. (PLATFORM) Center for Bioengineering Research Annual Biomechanics Research Symposium. Newark, DE. 2014

51. Butkerait C, Wright T, **Awad LN**, Reisman DS, Binder-Macleod SA. Factors that attribute body weight through a treadmill training intervention. (POSTER) Center for Bioengineering Research Annual Biomechanics Research Symposium. Newark, DE. 2014

50. **Awad LN**, Reisman D, Wright T, Binder-Macleod S. The validity of using cross-sectional relationships to identify deficits to target during walking training post-stroke. (POSTER) Johns Hopkins Rehabilitation Therapy Services Clinical Showcase. Baltimore, MD. 2013

49. **Awad LN**, Reisman D, Wright T, Binder-Macleod S. Do improvements in commonly targeted mobility deficits relate to improvements in post-stroke locomotor recovery following intervention? (PLATFORM) Center for Bioengineering Research Annual Biomechanics Research Symposium. Newark, DE. 2013

48. **Awad LN**, Binder-Macleod SA. Predictors of Functional Gait Recovery Following Treadmill Training in Post-stroke Individuals. (POSTER) Johns Hopkins Rehabilitation Therapy Services Clinical Showcase. Baltimore, MD. 2012

47. **Awad LN**, Kesar TM, Binder-Macleod SA. How many testing sessions are necessary to determine the effectiveness of post-stroke gait interventions? (POSTER) Center for Bioengineering Research Annual Biomechanics Research Symposium, Newark, DE. 2011

46. **Awad LN**, Kesar TM, Binder-Macleod SA. Post-Stroke Gait: Day-To-Day and Stride-To-Stride Variability. (POSTER) Center for Bioengineering Research Annual Biomechanics Research Symposium, Newark, DE. 2010.

Invited **Talks, Academic**

45. Digital Therapeutics for Neurologic Injury and Disease. Digital Health Summit. San Francisco, CA. 2023

44. Music-based digital interventions: Biomechanical and Clinical Evidence in Stroke. Meeting of the APTAMA Neurology SIG. Boston, MA. 2023

43. There has to be more that we can dofrom son to physical therapist to (wannabe) entrepreneur. ResearchER on Tap. Office of Research, Boston University. Boston, MA. 2023

42. Music-Based Digital Intervention: Biomechanical and Clinical Evidence in Stroke. University of Massachusetts-Amherst Seminar. Amherst, MA. 2023

41. Soft Robotic Exosuits For Post-Stroke Locomotor Recovery. Research on Tap. Office of Research, Boston University. Boston, MA. 2023

40. Locomotor Recovery After Stroke: fNIRS and beyond. Center for Neurophotonics 5-Year Review, Boston University. Boston, MA. 2023

39. May the (propulsion) force be with you: Wearable technologies for advancing the diagnosis and treatment of propulsion deficits. Academy of Physical Therapy Research Retreat. Beverly, MA. 2022

38. Propulsion-augmenting soft robotic exosuits for gait rehabilitation and assistance after stroke. Advances in Rehab Robotics. Indian Federation for Neurorehabilitation 10th Annual Conference. Virtual. 2022

37. May the (propulsion) force be with you: Soft robotic exosuits for post-stroke gait recovery. MossRehab Robotics and Technology in Rehabilitation Symposium. Philadelphia, PA. 2022

36. Developing and translating rehabilitation technologies for post-stroke rehabilitation. John Scholz Stroke Education Conference - Delaware Academy of Medicine. Virtual. 2021

35. Propulsion-augmenting soft robotic exosuits for gait assistance and rehabilitation after stroke. Shirley Ryan AbilityLab Legs+Walking Seminar Series. Virtual. 2021

34. May the (propulsion) force be with you: Soft robotic exosuits for post-stroke gait recovery. Medical Rehabilitation Track General Session, WeaRAcon 2021. Virtual. 2021

33. Rhythm and the motor system: A music-based digital therapeutic to automate individualized and progressive rhythm-based walking training after stroke. MGH Center for NeuroTechnology and NeuroRecovery Research Seminar Series. Virtual. 2021.

32. Rhythm and the motor system: New opportunities for post-stroke rehabilitation. Braintree Neurorehabilitation Conference. Virtual. 2020

31. Rehabilitation interventions and technologies for gait measurement, substitution, and restoration after stroke. Research blitz webinar hosted by Boston University Center for Neurophotonics. Virtual. 2020

30. Rhythm and the motor system: New opportunities for post-stroke rehabilitation. Academy of Neurologic Physical Therapy Webinar. Virtual. 2020

29. May the (propulsion) force be with you: Soft robotics for gait restoration after stroke. Meeting of the APTAMA. Boston, MA. 2019

28. Next-generation interventions and technologies for gait measurement, substitution, and restoration after stroke. Wyss Institute Bioinspired Soft Robotics Platform. Boston, MA. 2019

27. Rhythm and locomotion: New opportunities for gait training. AbilityLab. Chicago, IL. 2019

26. From lab to community: Gait-restorative interventions and technologies after stroke. Pilot Project to Impactful Science Symposium: Highlights from the BU Clinical and Translational Science Institute. Boston, MA. 2019

25. Soft robotic exosuits for patients post-stroke. WeaRAcon 2019. Scottsdale, AZ. 2019

24. Gait-restorative Technologies for Targeted Locomotor Rehabilitation after Stroke. Delegation of the Italian Ministry of Health Wounded Warriors Program. Charlestown, MA. 2018

23. Gait-restorative Technologies for Targeted Locomotor Rehabilitation after Stroke. Representatives of the European Institute of Innovation and Technology. Charlestown, MA. 2018

22. Gait-restorative Technologies for Targeted Locomotor Rehabilitation after Stroke. Grand Rounds Beth Israel Deaconess Medical Center. Boston, MA. 2018

21. Soft Robotic Exosuits for Gait-Restorative Assistance and Rehabilitation. Orthotic and Prosthetic Innovative Technologies Conference. San Francisco, CA. 2018

20. Diagnosing and Treating Deficits in Paretic Propulsion to Improve Walking After Stroke. Motion Analysis Laboratory. Spaulding Rehabilitation Hospital, Charlestown, MA. 2017

19. Next Generation Rehabilitation Robots: Soft Exosuits for Targeted Poststroke Locomotor Rehabilitation. Barrow Neurological Institute Stroke Rehabilitation Symposium, Phoenix, AZ. 2016

18. Soft Exosuits for Patients Poststroke. Stroke Research and Recovery Institute. Spaulding Rehabilitation Hospital, Boston, MA. 2016

17. New Paradigms for Locomotor Rehabilitation: Technologies and Interventions. College of Health and Rehabilitation Sciences: Sargent College, Boston University, Boston, MA. 2015

16. Soft Wearable Robots Poststroke. Spaulding Rehabilitation Hospital, Charlestown, MA. 2015

15. Principles of Experience-Dependent Neural Plasticity: Implications for Rehabilitation after Brain Damage by Kleim and Jones. Neuroplasticity Seminar, University of Delaware, DE. 2012

14. The Neuroanatomy of Motor Learning: Implications for the Damaged Brain. Neuroplasticity Seminar, University of Delaware, DE. 2012

13. Poststroke Gait Retraining: Research Update from the University of Delaware. Kessler Institute for Rehabilitation. West Orange, NJ. 2011

12. FES as a Tool for the Functional Rehabilitation of the Acute Stroke Patient. Johns Hopkins University Hospital, Department of Physical Medicine and Rehabilitation. Baltimore, MD. 2011

11. General Electrotherapy Principles for Rehabilitation Specialists. Johns Hopkins University Hospital, Department of Physical Medicine and Rehabilitation. Baltimore, MD. 2011

10. Effective Utilization of Clinical Predication Rules in the Outpatient Physical Therapy Setting. Kessler Rehabilitation Center. Hawthorne, NJ. 2011

9. Poststroke Gait Variability and Residual Gait Deficits Following Conventional Rehabilitation. St. Barnabas Medical Center Dept. of Rehabilitation Services. Livingston, NJ. 2010

Invited Talks, Industry

8. Theory, Science, & Practice of Music-Based Rhythmic Digital Intervention After Stroke. MedRhythms InTandem Launch Event. Portland, ME. 2023

7. On the origins of bipedal locomotion: Implications for gait re-training. MedRhythms Company-Wide Lunch & Learn. Portland, ME. 2021

6. Restoring paretic propulsion: Using an exosuit to address propulsion deficits after stroke. Wolters Kluwer Health Webinar. Virtual. 2020.

5. Innovations in Gait Rehabilitation. MedRhythms Videocast Series. Virtual. 2020.

4. A biomechanical framework for using rhythm to restore the optimality of human locomotion. Continuing education course hosted by MedRhythms. Virtual. 2020

3. Soft robotic exosuits for post-stroke propulsion recovery. ReWalk Robotics Webinar. Virtual. 2020
2. May the (propulsion) force be with you: Soft robotic exosuits for post-stroke gait recovery. ReWalk Robotics Invitational Dinner at the AAPM&R annual meeting. San Antonio, TX. 2019
1. Bipedal locomotion: Insights for technology developers. MedRhythms Inc. Boston, MA. 2019

MEDIA ATTENTION

Altmetrics

In addition to scientific impact, several of my papers have received significant social and news media attention, with four papers having Altmetric scores that place them in the top 4% of all research outputs:

- **Awad LN**, Lewek MD, Kesar TM, Franz JR, Bowden MG. These legs were made for propulsion: advancing the diagnosis and treatment of post-stroke propulsion deficits. Journal of Neuroengineering and Rehabilitation. 2020. Altmetric score: 52 (96th percentile)
- **Awad LN**, Esquenazi A, Francisco GE, Nolan KJ, Jayaraman A. The ReWalk ReStore soft robotic exosuit: a multi-site clinical trial of the safety, reliability, and feasibility of exosuit-augmented post-stroke gait rehabilitation. Journal of Neuroengineering and Rehabilitation. 2020. Altmetric score: 110 (98th percentile)
- **Awad LN**, Kudzia P, Revi DA, Ellis TD, Walsh CJ. Walking faster and farther with a soft robotic exosuit: Implications for post-stroke gait assistance and rehabilitation. IEEE Open Journal of Engineering in Medicine and Biology. 2020. Altmetric score: 176 (99th percentile)
- **Awad LN**, Bae J, O'Donnell K, De Rossi SMM, Hendron K, Sloot LH, Kudzia P, Allen S, Holt KG, Ellis TD, Walsh CJ. A soft robotic exosuit improves walking in patients after stroke. Science Translational Medicine. 2017. Altmetric score: 746 (99th percentile)

Media Coverage (select articles)

The content of these and other papers has been featured in regional, national, and international news stories:

- **Portland Press Herald:** Music as medicine: FDA approves stroke therapy from Portland startup
- **Inside Sargent:** The healing power of music, from Bach to Rock
- **Daily Free Press:** Neuromotor Recovery Lab makes strides in helping those with neurological diseases
- **Harvard Gazette:** The next decade in science
- **BU's The Brink:** Could a Robotic Backpack Replace Opioids to Relieve Lower Back Pain?
- **Wyss Institute:** Soft robotic exosuit makes stroke survivors walk faster and farther
- **Harvard Magazine:** The Medical-Robotics Revolution
- **SIRIUSXM 110:** Doctor Radio, Rehabilitative Medicine Show - Interview with Dr. Jonathan Whiteson
- **NeurologyLive:** Soft robot exosuit helps people improve their walking after suffering a stroke
- **Digital Trends:** ReStore Exo-Suit Proves Reliable for Post-Stroke Gait Rehabilitation
- **BU's The Brink:** Move Over, Iron Man
- **Futurity:** Robotic exosuit fixes stride after stroke
- **Boston Metro:** Boston researchers develop a robotic suit to help stroke patients walk
- **JAMA:** Biotech Innovations: Lightweight exosuit could help patients walk after stroke
- **Neurology Today:** Robotic Assist Devices Show Gains in Walking for Post-Stroke Hemiparesis

SERVICE

Editorships

2019–Present: Associate Editor, IEEE Open Journal of Engineering in Medicine and Biology
2015–Present: Associate Editor, Journal of NeuroEngineering and Rehabilitation
2021–2023: Associate Editor, PLoS ONE
2021–2023: Guest Editor, Special Issue on Digital Therapeutics, Frontiers in Digital Health / Medicine
2021–2022: Guest Editor, Special Issue on Rising Stars in Neurorobotics, Frontiers in Neurorobotics

Grant Review and Study Section Service

7/23: Ad-hoc Member, Small Business: Molecular, Cellular Sciences & Instrumentation Study Section, NIH
6/23: Ad-hoc Member, Musculoskeletal Rehabilitation Sciences Study Section, NIH
10/22: Ad-hoc Member, Musculoskeletal Rehabilitation Sciences Study Section, NIH
6/22: Ad-hoc Member, MOSS Small Business: Orthopedic Rehabilitation Study Section, NIH
2/22: Ad-hoc Member, Function, Integration, & Rehabilitation Study Section, NIH
6/21: Ad-hoc Member, Musculoskeletal Rehabilitation Sciences Study Section, NIH
2/21: Ad-hoc Member, Musculoskeletal Rehabilitation Sciences Study Section, NIH
8/17: Ad-hoc Member, Brain Injury: TBI & Stroke Merit Review Panel, Department of Veterans Affairs
8/15: Ad-hoc Proposal Reviewer, US Army Research Office

Professional Service

2019–Present: Research Committee, Academy of Neurologic Physical Therapy
2016–Present: Educational Session and Abstract Reviewer, Academy of Neurologic Physical Therapy
2015–Present: Ad-hoc Manuscript Reviewer for >15 clinical, engineering, and rehabilitation journals
08/2022: Chair, Wearable Sensors Individual Oral Sessions, North American Congress on Biomechanics
02/2021: Group leader, Academy of Neurologic Physical Therapy Early Career Workshop
08/17: Co-Chair, Thematic Session on Poststroke Biomechanics, American Society of Biomechanics
08/16: Ad-hoc Abstract Reviewer, Section on Research, American Physical Therapy Association

Boston University Doctor of Physical Therapy Program

2022–Present: Department Grand Rounds Seminar Co-Coordinator
2016–Present: Professional student advising (>15 DPT students)
07/17–09/18: Taskforce Chair, DPT/PhD Combined Program Development Taskforce

Boston University Rehabilitation Sciences Doctoral Program

2016–Present: PhD Admissions, Applicant Reviewer
09/2020–12/2020: PhD Steering Committee, Member

Boston University College of Health and Rehabilitation Sciences: Sargent College

06/17–05/18: Member, Graduate Education Committee

University of Delaware College of Health and Rehabilitation Sciences

2013–2014: Senator, Faculty Senate
2013–2014: Senator, Graduate Student Senate
2012–2014: DPT Admissions, Applicant Reviewer
2012: Student Steering Committee, 9th Annual Biomechanics Research Symposium

CLASSROOM TEACHING

Boston University

Primary Instructor

Scientific Basis for Human Movement (PT550)
- Newly developed course in Fall 2021 for Doctor of Physical Therapy Program
- Taught in Fall '21 and '22 (∼70 students)
- 4.8 out of 5 average instructor rating

Evidence Based Practice 2 (PT662)
- Newly developed course in Fall 2016 for Doctor of Physical Therapy Program
- Taught in Fall '16, '17, '19, '20, '21, '22 (∼70 students)
- 4.9 out of 5 average instructor rating for last 4 semesters

Movement Science Seminar (HP891)
- Newly developed course in Fall 2019 for PhD in Rehabilitation Sciences Program
- Taught in Fall '19, '20, and Spring '20 (∼7 students)
- 4.5 out of 5 average instructor rating

Directed Readings/Research (RS910/11)

- Student-individualized directed research or readings
- Taught every semester (∼2 to 6 PhD students per semester)

Co-Instructor

Doctoral Seminar Rehabilitation Sciences (RS890)
- Taught in Spring '17 (15 students)
- 4.9 out of 5 instructor rating

Senior Design Project (BE465)
- Taught in Fall '16 & '17 and Spring '17 & '18 (∼3 to 5 students)

Guest Lecturer

Special Topics (PT760)
- Taught in Fall '21
- Lecture Topic: Neurorehabilitation Technology

Emerging Topics (HP870)
- Taught in Spring '21
- Lecture Topic: Digital and Robotic Technologies

Instrumentation for Analysis of Motion (HP737)
- Taught in Fall '19
- Lecture Topic: Instrumented Treadmills

Foundations for Rehabilitation Sciences (RS650)
- Taught in Fall '16, '17, '18, '20
- Lecture Topic: Neural Control of Movement

Harvard University

Medical Device Design (ES227)	Team Advisor

University of Delaware

Integrated Clinical Experience (PHYT822)	Clinical Instructor
Applied Physiology II (PHYT633)	Guest Lecturer and Laboratory Instructor
Electrotherapy (PHYT634)	Guest Lecturer and Laboratory Instructor
Spine Management (PHYT808)	Teaching Assistant
Human Anatomy (NURS101)	Cadaver Laboratory Assistant

Rutgers University

Exercise Physiology (EXSCI370)	Primary Laboratory Instructor

RESEARCH ADVISING

PhD Students

Primary Advisor and Dissertation Committee Chair

Ruoxi Wang, PhD in Rehabilitation Sciences, Boston University

Dheepak Arumukhom Revi, PhD in Mechanical Engineering, Boston University

Regina Sloutsky, PhD in Rehabilitation Sciences, Boston University

Ashlyn Aiello, PhD in Rehabilitation Sciences, Boston University

Ashley Collimore, PhD in Rehabilitation Sciences, Boston University

Andre Alvarez, PhD in Rehabilitation Sciences, Boston University (co-advised with Dr. Cara Lewis)

Anna Roto, PhD in Rehabilitation Sciences, Boston University

Dissertation/Thesis Committee Member

Sean Carroll, MS in Mechanical Engineering, Boston University

Jenna Zajac, PhD in Rehabilitation Sciences, Boston University

De'Ja Rogers, PhD in Biomedical Engineering, Boston University

Marc Mitjans, PhD in Mechanical Engineering, Boston University

Catherine Adans-Dester, PhD in Rehabilitation Sciences, MGH Institute of Health Professions
Evelyn Park, PhD in Materials Science & Mechanical Engineering, Harvard University
Jaehyun Bae, PhD in Materials Science & Mechanical Engineering, Harvard University
Krithika Swaminathan, PhD in Materials Science & Mechanical Engineering, Harvard University
Brendan Quinlivan, PhD in Materials Science & Mechanical Engineering, Harvard University
Dabin Choe, PhD in Materials Science & Mechanical Engineering, Harvard University

Qualifying Exam Committee Member

Jaimie Girnis, PhD in Rehabilitation Sciences, Boston University
Amber Norman, PhD in Human Physiology, Boston University (Chair of Qualifying Exam)
Alyda Huerta, PhD in Mechanical Engineering, Boston University
Ramon Sanchez, PhD in Mechanical Engineering, Boston University

Postdoctoral Research Fellows

Dave Sherman, PT, DPT, PhD; Boston University, Co-advisor
Michail Theofanidis, PhD; Boston University, Co-advisor
Franchino Porciuncula, PT, PhD; Harvard University, Co-advisor
Lizeth Sloot, PhD; Harvard University, Co-advisor

Research Physical Therapists

Kim Ang, Boston University, Primary Supervisor
Lynn Demming, Boston University, Primary Supervisor
Johanna Spangler, Boston University and Spaulding Rehabilitation Hospital, Primary Supervisor
Regina Sloutsky, Boston University and Harvard University, Primary Supervisor
Ben Farmer, Boston University, Primary Supervisor
Teresa Baker, Boston University and Harvard University, Co-supervisor

Doctor of Physical Therapy Students

Nora Chan, Boston University, Co-advisor
Akshat Mehta, Boston University, Co-advisor
Candy Qiu, Boston University, Primary Advisor
Macauley O'Connor, Boston University, Primary Advisor
Jeffery Paskewitz, Boston University, Primary Advisor
Catie Ledwick, Boston University, Primary Advisor
Tori Torrisi, Boston University, Primary Advisor

Undergraduate Researchers

William Swift, Boston University, Primary Advisor
Joshua Singh, Boston University, Primary Advisor
Eduardo Cedona, Harvard University, Primary Advisor
Brady Reynolds, Boston University, Primary Advisor
Amogh Chandupatla, Boston University, Primary Advisor
Arianna DiGregorio, Boston University, Primary Advisor
Fiona Doolan, Boston University, Primary Advisor
Christopher Schenck, Harvard University, Co-advisor
Kerri Wu, Harvard University, Co-advisor