

# UNIVERSITY OF HARTFORD

---

## DEPARTMENT OF REHABILITATION SCIENCES

### DOCTORATE OF PHYSICAL THERAPY PROGRAM DOCTORAL RESEARCH FINAL PRESENTATIONS

October 26, 2022

12:00-2:00pm

Wilde Auditorium

#### **12:05-12:20 Presentation 1: Hawks in Motion: Feasibility study of student run high intensity exercise for individuals with neuromotor disabilities on campus post-COVID**

Students: Annelise Coburn, Lauren Lomonaco, Jillian McManus, Bailey Provencal, Alyssa Powers, Michelle Valliere

Mentor: Mary Gannotti, PhD, PT

*Community based high intensity exercise programs play an important role in the function and fitness of individuals with neuromotor disability. During COVID restrictions for social distancing, students designed and delivered a telehealth program for people with neuromotor disability. As restrictions were lifted, students designed a face-to-face high intensity program for people with neurodevelopmental disabilities and transitioned to individuals with neuromotor disability. Hawks in Motion is a high intensity exercise program that occurs twice a week for 10 weeks. This presentation reports on the first semester of the program in Spring 2022 with individuals with neurodevelopmental disabilities, and the current program in Fall 2022 with individuals with neuromotor disability.*

#### **12:20-12:35 Presentation 2: Activity Based Locomotor and Balance training for a child with severe disability.**

Students: Amy Grindle, Sam Moravsky, Lilia Mosijchuk, Sammi Peters, Bethany Re, Mariah Tuthill

Mentors: Sandra Saavedra, MS, PT, PhD and Donna Snowdon, MS, DPT

*The purpose of this research was to complete pilot data from an episode of high intensity activity-based locomotor training for a non-ambulatory and non-verbal 7-year-old. The students completed pre, mid and post intervention evaluations using standardized outcome measures along with providing 90 hours of treadmill and locomotor training (1.5 hours per day, 5 days per week for 60 sessions). Students investigated and employed custom modifications based on the child's level of trunk control, foot and ankle alignment and cortical visual impairment (CVI). The child made significant gains and retained them for 5 months. She demonstrated gains in gross motor function, remarkable improvement in independence for use of a gait trainer and increased her participation in home and community settings. She did not, however, show changes in her level of trunk postural control.*

#### **12:35- 12:50 Presentation 3: Characterization of Adolescent Shod Overground Running**

Students: Caroline Cappello, Cody Filingeri, Elia Galdamez, Alan Savage, Samantha Towle, Bonnie Wilder

Mentors: Kelly Pogemiller, PT, DPT, EdD Cand. and Kristamarie Pratt, PhD. MEng

*The typical running kinematics and kinetics are well understood in adult shod runners, however little is known about adolescent shod runners. Previous research has shown that changing running speed, cadence, and stride length can help decrease vertical ground reaction force which has been linked to injury in adults. However, there is limited data to support a typical adolescent running pattern and these findings. Therefore, the purpose of our research is to determine if the relationships found in adults hold true in adolescent shod runners. Our aim was to help identify "typical" running patterns in a healthy adolescent population that can guide our understanding for injury prevention in this population.*

**12:55-1:10 Presentation 4: Acute effects of neuromuscular electrical stimulation and voluntary exercise on neuromuscular functions and properties**

Students: Patrick Brodoff, Victor Gaza, Nathan Gockel, Vinz Umali, Daniel Vala, Hayden Walker

Mentor: Xin Ye, PhD

*Wide-pulse ( $\geq 1ms$ ) high-frequency ( $\geq 100Hz$ ) neuromuscular electrical stimulation (WPHF NMES) has been examined in recent years. However, it is unknown whether the WPHF NMES combined with voluntary isometric exercise would induce more neuromuscular fatigue. This study aims to examine 1) the potential sex-related differences in WPHF NMES-evoked force level in human elbow flexor muscle; and 2) the potential condition difference when applying NMES vs. Voluntary exercise vs. NMES+voluntary exercise on muscle fatigue. Twenty-two healthy adults (10 women) completed this study in AY 2021-2022. This presentation will report the main findings from this research study.*

**1:10-1:25 Presentation 5: A comparative study of the M-Score, Tinetti, Mini-Cog and Frailty: Validity and reliability in assessing fall risk and functional mobility in older adults.**

Students: Danna Alnajjar, Dylan Andrews, Rebecca Kalber, Ashley Robidoux, Madison Stabile

Mentor: Walt Gorack PT, DPT, MBA, GCS

*The primary purpose of this study was to assess fall risk and balance using the University of Hartford developed M-score (UHMS) in community-dwelling older adults using four outcome measures. The M-Score was compared to the Tinetti Performance Oriented Mobility Assessment (POMA) to determine overall fall risk in older adults and the validity of the M-Score as an outcome measure. The secondary purpose of this study included administering a self-perceived health questionnaire and Mini-Cognitive Exam to investigate other factors that may contribute to fall risk including; cognition, comorbidities, and polypharmacy, and their potential impacts on the overall risk of falls in older adults.*

**1:25- 1:40 Presentation 6: The Influence of Spine Position on Measures of Lower Extremity Neural Sensitivity**

Students: Kaitlin Brosnihan, Elizabeth Clark, Chase Conway, John McCarthy, Olivia Norman, Olivia Wilson

Mentor: Brian T. Swanson, PT, DSc, OCS, FAAOMPT

*The slump test is commonly used to assess for symptoms of adverse neural tension in individuals with neuropathic symptoms of spinal origin. However, clinical experience has shown that some individuals demonstrate greater symptoms with their lumbar spine extended rather than flexed. We sought to determine: 1) "Are there differences in signs/ symptoms during neurodynamic testing in various spine positions?" and 2) "Are there differences in hamstring activity with neurodynamic testing in various spine positions?" . To answer these questions, we recruited a group of healthy individuals, and assessed the intensity, distal extent and nature of symptoms (stretch or neuropathic), available knee extension ROM, and hamstring EMG activity (as a proxy for onset of neural tension) during the performance of four sequential tests: 90/90 knee extension test, straight leg raise, standard (flexed) slump test, and an extended spine slump test.*