

UNIVERSITY OF HARTFORD

DEPARTMENT OF REHABILITATION SCIENCES

DOCTORATE OF PHYSICAL THERAPY PROGRAM DOCTORAL RESEARCH FINAL PRESENTATIONS

DPT Class of 2024

November 8, 2023

12:00-2:00pm

Wilde Auditorium

12:15-12:30 Presentation 1: Hawks in Motion High Intensity Exercise for People with Neurologic Disability

Students: Sarah Baptiste, Tricia Hamilton, Danielle Jaffer, Andrea Petramale, Emily Steele, Jasmine Streeter

Mentor: Mary Gannotti, PT, PhD; Jillian Kossbiel, DPT, NCS; Erika Ozdemirer, DPT, NCS

This project focuses on the implementation of clinical practice guidelines and best practice for high intensity exercise from the American Physical Therapy Association and the American College of Sports Medicine for individuals with neurologic disabilities. The aim was to adapt guidelines from 3-5 times a week to 2 times a week using implementation science frameworks and plan-do-study-act cycles. The first three of five plan-do-study-act cycles are described, with a focus on addressing feasibility questions. Feasibility benchmarks focus on attendance, meeting person centered goals, obtaining physical and functional changes, and program satisfaction. Interim program development is described, process changes highlighted, and work to be done in the future is suggested.

12:30-12:45 Presentation 2: Acute Effects of Percussion Massage Gun Therapy on Muscle Soreness

Students: Emma Brown, Emily Clausi, Cassandra Hale, Joshua Hudak, Amber Marino, Taylor Mezanko

Mentors: Xin Ye, PhD

This study examined the efficacy of percussion massage therapy, delivered via a percussion massage gun, on exercise-induced muscle soreness and other neuromuscular properties. Twenty subjects completed 6 sets of 10 repetitions of elbow flexion eccentric exercise at 80% of the one-repetition maximum. One group (n =10) received percussion massage therapy, and the control group (n =10) received no post-exercise treatment. The study consisted of 5 different visits including familiarization, exercise, 24 hr post-exercise, 48 hr post-exercise, and 168 hr post-exercise visits. Outcome measurements taken at these different time points were range of motion (ROM), muscle soreness (VAS), upper arm circumference (cm), eccentric exercise (RPE), elbow flexion isometric strength (MVIC), and elbow flexor voluntary activation (%). The intervention group received a 5-minute percussion massage to their elbow flexor muscle group at the end of the exercise, 24hr, and 48hr post-exercise visits. No group differences were observed for all dependent variables. However, we noticed a small treatment effect of percussion massage intervention alleviating muscle soreness at 24 hours post-exercise, when compared to the control. Our results suggest that percussion massage therapy does not accelerate muscle recovery following an intensive exercise session.

12:50- 1:05 Presentation 3: The Reliability and Concurrent Validity of Goniometric, Visual Estimation, and the Patient Specific Functional Scale in Participants with Unilateral Shoulder Pain.

Students: Amy I. Bousquet, SPT, ATC, Leif Erik Aronsen, SPT, Jenna M. Atlas, SPT, Brianna M. Corrado, SPT, Harrison Pijloo, SPT, Nicholas A. Queiroz, SPT

Mentors: Matthew Austin, PT, DPT, OCS, MTC, Sean P. Riley, PT, DPT, ScD, OCS, FAAOMPT

Background: The Constant-Murley Score (CMS), which uses universal goniometry (UG), and the Shoulder Functional Reach Score (SFRS), which uses visual estimation (VE), are described in the literature. The CMS has validity challenges, and the SFRS has been critiqued for using VE. Establishing if VE is a reliable and valid objective measurement as part of the SFRS becomes essential in establishing the validity of this tool. **Purpose:** The study sought to determine the reliability and concurrent validity of VE when compared to the UG for shoulder flexion (FLX) and abduction (ABD) as used in the SFRS. This study determined if there were differences between symptomatic and asymptomatic shoulders and between expert and novice raters when using these tools. **Methods:** Participants were included if they were at least 18 years old with unilateral, symptomatic shoulder pain, with no post-surgical contraindications. Participants were excluded if symptoms were less than 2/10, bilateral, consistent with cervical or neurological pathology, had a needle injection in the past month, or were currently receiving therapy for shoulder pain. **Results:** The intertester reliability between UG and VE were the following: UG intraclass Correlation Coefficient (ICC) values were 0.76 for FLX and 0.91 for ABD for visit one. VE of ICC values ranged from 0.92 for FLX and 0.87 for ABD at visit one. VE test-retest reliability had ICC values from 0.86 to 0.94 for FLX and 0.83 to 0.81 for ABD. Concurrent validity between raters one and two had rho values from 0.86 to 0.84 for FLX and 0.86 to 0.89 for ABD at visit one. **Discussion:** Study results suggest that both UG and VE of active shoulder FLX and ABD are reliable and concurrently valid. To determine external validity, future research should determine if these findings translate to the SFRS and a more diverse participant population.

1:05-1:20 Presentation 4: Does Reactive Agility Training Reduce Knee Injury Risk Factors In Collegiate and High School Athletes

Students: Patrick Brown, SPT, Matthew Glassoff, SPT, Margaret Hofbauer, SPT, Kelsey Kiltonic, SPT, Ethan Pearson, SPT, Emily Rada, SPT, Megan Scherer, SPT

Mentor: Kristamarie Pratt, PhD, MEng; Sarah Ridge, PhD

This pilot study aimed to investigate the relationship between the acute effects of reactive agility training and ACL injury risk factors in collegiate and high school athletes. Reactive agility training (RAT) has been measured and tested as a means to assess an athlete's physical, technical and cognitive quality. In addition, RAT has been found to improve reaction time, decrease injury prevalence and predict an athlete's performance, which was the intent of this study. Biomechanical risk factors associated with non-contact ACL injuries include hip adduction, hip internal rotation, and knee valgus. Common knee moments such as external rotation, abduction and anterior tibial shear have also been reported to be correlated with non-contact ACL injuries.

The idea of the acute effects of performing reactive agility training directly before a game situation has been questioned in which there is a lack of research. It is our goal to devise a drill that will decrease ACL injury risk factors in high level athletes which can then be used in a pre-game warmup.

1:25-1:40 Presentation 5: The Association Between Grip Strength, High Risk Drugs (HRD), and Cognition on Fall-Risk in Community-Dwelling Older Adults

Students: Makenna Capalbo, Rachel Card, Zach Fuentes, Ryan McIntyre, Ryan Ribaud, Toni Williams

Mentor: Walt Gorack PT, DPT, MBA, GCS

This study investigated the potential relationship between grip strength and fall risk using a hand-held digital goniometer and the Dynamic Gait Index. Our subjects were community-dwelling older adults with a mean age of 79 undergoing post- acute rehabilitation. We further examined whether there was an association between high-risk drugs (HRDs) and fall risk as well as cognitive impairment and fall risk. Previous research has shown that higher grip strength is associated with better general health, and we aimed to explore whether balance and grip strength may be associated as well. An association could have a meaningful impact for clinicians performing evaluations or community health screens.