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PHYSICAL THERAPY

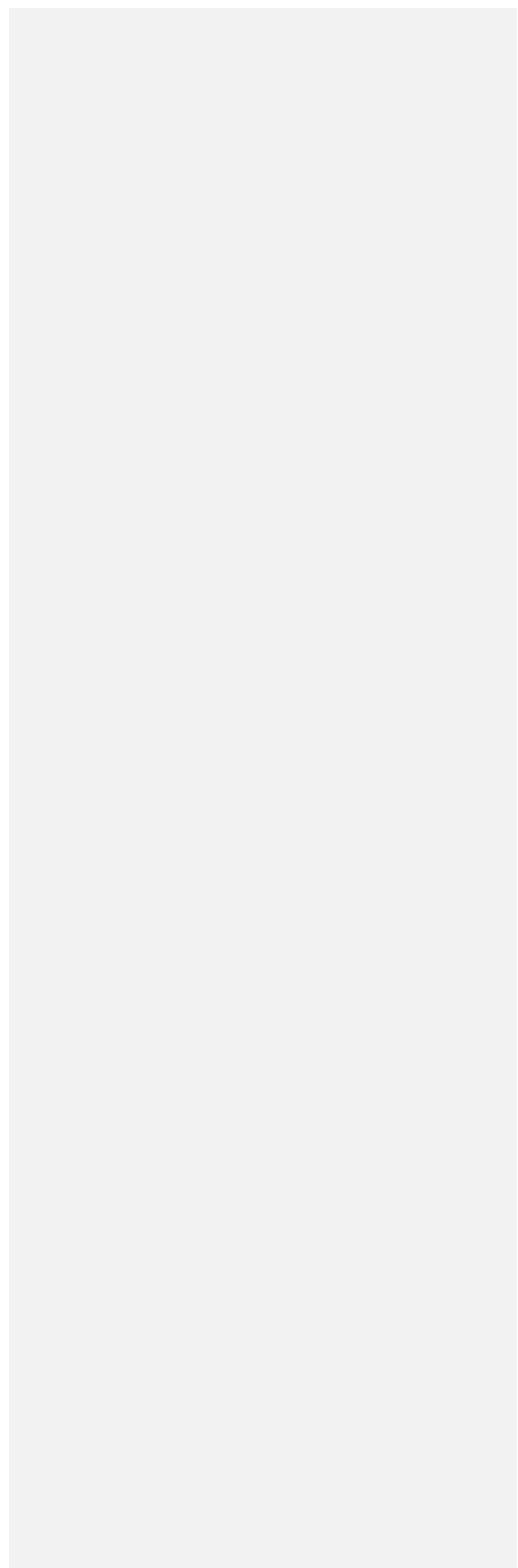
DPT Research Day

Class of 2024

Abstracts for Platform and Poster Presentations

**Thursday, July 11, 2024
1:30 – 5:00 pm
Rooms 102-104
DeVos Center for Interprofessional Health
Grand Rapids, MI**

PLATFORM PRESENTATIONS
TRACK A, SESSION 1



INTERVENTIONS FOR INDIVIDUALS WITH ANTERIOR CANAL BENIGN PAROXYSMAL POSITIONAL VERTIGO: A SYSTEMATIC REVIEW

Davis LJ, Dunham AM, Sarchet AL; Grand Valley State University, Grand Rapids, Michigan

INTRODUCTION: Benign paroxysmal positional vertigo (BPPV) impacts an individual's ability to perform their daily activities. The two most notable symptoms typically reported by individuals with BPPV are nystagmus and vertigo. While extensive research has examined repositioning maneuvers to treat posterior canal BPPV (PC-BPPV) and horizontal canal BPPV (HC-BPPV), there is a gap in the research related to the use of anterior canal BPPV (AC-BPPV) maneuvers. The purpose of this systematic review was to evaluate the current state of the evidence regarding the effectiveness of repositioning maneuvers for individuals with AC-BPPV.

METHODS: A systematic review was conducted using ProQuest Medical Database, PubMed, and Wiley Online Library using the search terms (“positional vertigo” OR “positioning vertigo” OR “positional nystagmus” OR “positioning nystagmus”) AND (“anterior canal” OR “superior canal”). Inclusion criteria for studies in the review were as follows: individuals 18 years of age and older, a diagnosis of AC-BPPV, a specific repositioning maneuver for AC-BPPV, resolution of symptoms, and an evidence level of a 2 or 3. Exclusion criteria were a diagnosis of PC-BPPV, HC-BPPV, or any other vestibular condition. The Level of Evidence for each study was determined using the Oxford Centre for Evidence-Based Medicine (OCEBM) 2011 Levels of Evidence. A 10-item tool created by Medlicott and Harris was used to assess methodological rigor of included studies. The Evidence Alert Traffic Light Grading System (EATLS) was used to provide an overall appraisal of the available evidence.

RESULTS: After an electronic database search and hand-searching records, 485 articles were identified. Of these, 6 articles met the inclusion and exclusion criteria and were included in the review. All 6 articles were rated at an OCEBM Level 3 of evidence, with methodological rigor scores ranging from 2-4, indicating weak methodological rigor. In 3 of the 6 included studies, the Yacovino maneuver was utilized for treatment of AC-BPPV. These 3 studies further identified that the Yacovino maneuver was more likely to be successful for individuals with canalithiasis versus those with cupulolithiasis. After undergoing the Yacovino maneuver, some participants experienced cannular conversion from the anterior canal to the posterior canal. However, with the use of PC-BPPV specific canalith repositioning maneuvers, all participants’ vertigo and nystagmus symptoms were resolved. Along with the Yacovino maneuver, 3 additional AC-BPPV treatment maneuvers were found to be effective in the treatment of AC-BPPV: the maneuver as described by Korres et al. 2010, the maneuver as described by Casani et al. 2010, and the maneuver as described by Kim et al. 2005. The EATLS rating for use of specific maneuvers for AC-BPPV is yellow: *caution needed: measure*.

DISCUSSION: Overall, there is limited research on effective treatment maneuvers for AC-BPPV. The existing research found in this review has a low level of evidence, likely due to low prevalence of AC-BPPV in the population. Though difficult to conduct due to the low prevalence of AC-BPPV, employing randomized controlled research designs in future studies would assist in improving the overall evidence on this topic.

CONCLUSIONS: This systematic review identified 4 repositioning maneuvers that physical therapists can use to treat AC-BPPV.

LEARNING TO STAND IN A PWSD: A SCOPING REVIEW OF ASSISTIVE TECHNOLOGY TRAINING APPROACHES. Rogers E, Banks J, Misiak A; Grand Valley State University, Grand Rapids, MI

INTRODUCTION: Powered wheelchair standing devices (PWSDs) allow children with severe mobility impairments to stand whenever and wherever they desire. For children who have never been able to stand independently and access the vertical plane, this ability to “Stand-on-Demand” represents a radical paradigm shift that could dramatically increase their participation, autonomy, and independence. However, there is very limited research regarding how to support these children in learning to use and integrate the PWSD standing feature into their daily lives. Given this dearth of PWSD specific research, the purpose of this scoping review was to identify published training methods used to support learning to use and integrate assistive technology devices into daily life and use our findings to develop an intervention to assist children in learning to use the standing feature of their PWSD. **METHODS:** This scoping review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist. A research librarian created and conducted literature searches in PubMed, CINAHL, ERIC, Professional Development Collection, and Google Scholar. Only articles published in English were included in the review. Inclusion criteria were articles providing: (1) a description of training methods pertaining to how to use/how to learn to use an assistive technology device and (2) sufficient detail to allow the training methods to be reproduced. Exclusion criteria were articles: (1) published before 1990; (2) focused on details that were not generalizable to other assistive technology devices; (3) focusing solely on the development of technology devices; or (4) conference abstracts. Initial screening and full-text review were conducted independently by 2 researchers. Data regarding training approaches were extracted from included articles in duplicate. **RESULTS:** A total of 15,399 records were identified in the searches. Of these, 54 met the inclusion/exclusion criteria and were included in the review. The included articles strongly emphasized the need to individualize assistive technology training methods. Under this umbrella of individualized training, 4 specific assistive technology training methods were identified in the included articles: *Technology Enhanced Approaches*, *Training Delivery Approaches*, *Training Progression Approaches*, and *Learner Engagement Approaches*. **DISCUSSION:** Although assistive technology training must be individualized to meet the needs of each specific learner, the 4 specific training approaches identified in this review provide the basis for developing an intervention to assist children in learning to use the standing feature of their PWSD. For example, using information from digital sensors built into their PWSD, children could track their standing frequency and duration via a game-like electronic application (*Technology Enhanced Approaches*). A one-on-one training model may help to provide specific facilitating techniques for utilization of the standing feature (*Training Delivery Approaches*). Using an approach that allows for progression while training may allow the trainee to adapt to using the standing feature more functionally (*Training Progression Approaches*). Providing individually meaningful opportunities for the child to practice using the PWSD standing feature may help them to better understand how to integrate standing in their PWSD into their daily lives (*Learner Engagement Approaches*). **CONCLUSION:** The findings of this review can be used to develop an intervention to assist children in learning to use the standing feature of their PWSDs. Helping these children learn to stand in their PWSDs may facilitate a paradigm shift that allows them to maximize their participation, autonomy, and independence.

**PLATFORM PRESENTATIONS
TRACK B, SESSION 1**

FEASIBILITY AND RELIABILITY OF THE YMCA 3 MINUTE STEP TEST IN ADULTS WITH CYSTIC FIBROSIS

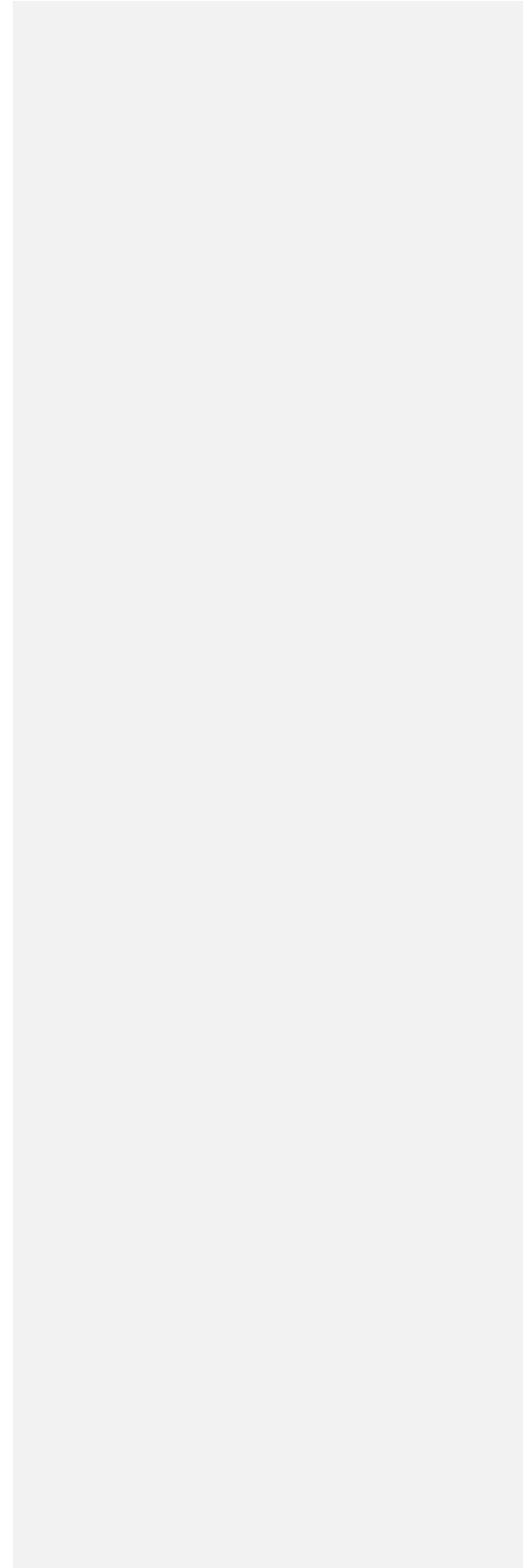
Bradford N¹, Hammond B¹, Miller T¹, Preston K², Shoemaker MJ^{1,2}, Van Dam A^{1,2}, McClelland M¹; ¹Grand Valley State University, Grand Rapids, Michigan; ²Corewell Health West Adult Cystic Fibrosis Clinic, Grand Rapids, Michigan.

INTRODUCTION: Regular exercise testing for individuals with Cystic Fibrosis (CF) is recommended and considered to be a standard of care because it can inform exercise and physical activity prescription, monitor for decline in function with disease progression, provide prognostic information, and assess response to intervention. The YMCA 3 Minute Step Test (3MST) is a metronome-paced test that allows for better standardization of effort and workload and can be completed in the examination room to maintain infection control. Although step tests have previously been studied in the CF population, few studies have been in adults with CF and none have been conducted since the availability of highly effective modulator therapy including, elxacaftor/tezacaftor/ivacaftor. Therefore, the purpose of the present study is to examine the feasibility and test-retest reliability of the YMCA 3MST in adult patients with CF, as well as the associations between peak heart rate (HR), HR recovery, blood pressure, oxygen saturation (SpO₂), and perceived exertion responses among each other and to clinical characteristics and health-related quality of life. **METHODS:** Thirty-two subjects recruited from an adult CF clinic in a cardiothoracic quaternary care health system completed the YMCA 3MST twice separated by at least 30 minutes in addition to completing the Cystic Fibrosis Questionnaire-Revised (CFQ-R). Test-retest reliability was calculated for peak HR, peak percent of predicted maximum HR (peak %MaxHR), and 60 second recovery heartbeat count (HBC) using the ICC (2,1). The minimum detectable change value (MDC95%) for peak HR, peak %MaxHR, and recovery HBC was calculated as $MDC95\% = z * SEM * \sqrt{2}$. Pearson correlation coefficients were used to examine the associations between peak HR, peak %MaxHR, HR recovery, blood pressure, SpO₂, and perceived exertion responses among each other and to clinical characteristics and CFQ-R health-related quality of life scores. **RESULTS:** Five of the patients (17.8%) enrolled in the study were unable to complete the first test due to knee pain, excessive heart rate response, or difficulty maintaining the set pace. Mean (standard deviation) time to complete the test was 9.7 (2.6) minutes. Regarding test-retest reliability, the highest ICCs (95% confidence interval) were: peak HR = 0.94 (0.87, 0.97), peak %MaxHR = 0.94 (0.87, 0.97), and recovery HBC = 0.93 (0.85, 0.97). There were no statistically significant associations between any physiologic test parameter and clinical characteristics or any domain of the CFQ-R. The MDC95% for peak heart rate, peak %MaxHR, and recovery HBC was calculated to be 7.8 beats per minute, 4.2%, and 8.5 beats, respectively. **DISCUSSION:** The YMCA 3MST is a feasible and reliable exercise test to be used in adult patients with CF. Given that peak HR, peak %MaxHR, and recovery HBC had excellent test-retest reliability, any of these parameters could be used clinically to detect changes over time using the MDC95% values calculated in this study. **CONCLUSION:** The YMCA 3MST required minimal time to complete and could be conducted in a standard exam room. Knee pain and inability to keep the set pace of the test may be a barrier for some patients.

ASSESSMENT OF STRENGTH BY PHYSICAL THERAPISTS IN THE UNITED STATES: PRACTICES, BARRIERS, AND PRIORITIES. Hoogenboom, BJ, Story, CM, Metzger, LM, Prisichenko, KA; Grand Valley State University, Grand Rapids, MI

INTRODUCTION: Strength assessment holds a pivotal role in the practice of physical therapy, influencing decision-making processes and treatment strategies. While manual muscle testing has traditionally been a cornerstone of strength evaluation, the advent of objective strength measurement tools has introduced new possibilities for accurate and reliable assessment. The purpose of this study was to investigate if and how PTs measure strength as an outcome measure in musculoskeletal physical therapy practice. A secondary purpose was to investigate which patient populations PTs considered important for the use of objective measurements of strength. The final purpose was to investigate barriers to and needs regarding the use of hand-held dynamometry (HHD). **METHODS:** The research design was a cross-sectional survey. Two-hundred and twenty-six licensed physical therapists in the United States who primarily treated musculoskeletal disorders were included in the study. Qualtrics^{XM} was used to deliver the survey and collect data. SPSS Version 29 and Qualtrics^{XM} were used to analyze the data. Logistic regressions and chi-squared tests were used for statistical analysis ($p < 0.05$). **RESULTS:** One hundred percent of the respondents assessed strength in some manner, with the two most frequently used methods being manual muscle testing (89%) and functional movements (80%). The top populations in which HHD was indicated included secondary school to college age patients (14 to 24 years old) (Likert score: 3.84, very important) and athletes (Likert score: 4.18, extremely important). The top two barriers to HHD use included lack of equipment (Likert score: 4.34, strongly agree) and lack of training/knowledge (Likert score: 3.17, somewhat agree) of different objective strength measurement methods. **DISCUSSION:** Manual muscle testing remains prevalent, but there may be a trend towards incorporating OSM tools, despite barriers such as cost and limited education. Years of experience as a physical therapist emerged as a predictor of HHD utilization, contrary to expectations, suggesting seasoned PTs may have a greater capacity to adapt to new technology. Certified PTs were significantly more likely to use OSM, potentially due to specialized training and familiarity with rehabilitation protocols. **CONCLUSION:** Physical therapists employ various methods to assess strength and consider athletes and younger patient demographics the most important in which to utilize objective strength measurements. Certified PTs and those with more experience are more likely to use HHD devices, yet less than half of PTs utilize them regularly. The findings emphasize the need for enhanced education and training on objective strength measurement tools to facilitate their widespread integration into practice.

POSTER PRESENTATIONS



ASSESSMENT OF STRENGTH BY PHYSICAL THERAPISTS IN THE UNITED STATES: PRACTICES, BARRIERS, AND PRIORITIES. Hoogenboom, BJ, Story, CM, Metzger, LM, Prisichenko, KA; Grand Valley State University, Grand Rapids, MI

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THE EFFECTIVENESS OF PAIN NEUROSCIENCE EDUCATION ON CRANIOMANDIBULAR DYSFUNCTION: A SYSTEMATIC REVIEW

Slowik KA; Bullinger EJ; Mettler AC; Grand Valley State University, Grand Rapids, Michigan

INTRODUCTION: To explore the effectiveness of pain neuroscience education (PNE) as an additional treatment strategy for craniomandibular dysfunction (CMD) regarding physical therapy related outcome measures. **METHODS:** Articles were included if they addressed CMD using physical therapy interventions and used PNE principles as an intervention. Studies were excluded if they were written in languages other than English, used reviews as their study design, included animals, or used counseling, cognitive behavioral therapy, surgery, or stress management as the primary intervention. The following databases were searched on June 2, 2023: PubMed, CINAHL Complete, PsycINFO, and Web of Science Core Collection. No automation tools were used in article screening or synthesis. Article data was individually extracted into a table. **RESULTS:** Of the 805 articles screened, eight articles were included: three randomized control trials, two case series, one case report, one nonrandomized control trial, and one protocol for a randomized control trial. A methodological rigor assessment revealed evidence levels ranging from moderate to high. Out of 8 included articles, there were 343 individuals, predominantly female, with ages ranging from 18 to 67 years old. Various interventions were examined, with most spanning 5-6 weeks, incorporating PNE alongside other physical therapy interventions. Overall, significant improvements in CMD symptoms were observed following the application of PNE, including reductions in pain intensity, enhanced movement tolerance, and decreased fear associated with movement. Subgroup analyses revealed variations in outcomes based on specific PNE principles employed, with all studies incorporating PNE approaches reporting significant reductions in pain severity and improvements in psychosocial well-being. **DISCUSSION:** The findings of this study indicate that incorporating PNE into physical therapy interventions for CMD leads to significant improvements in pain intensity, movement tolerance, and fear associated with movement. These results align with previous research on PNE across various musculoskeletal disorders, highlighting its potential to positively influence pain experience and functional abilities. However, further investigation into the effectiveness of PNE alone for CMD is warranted to fully understand its impact as an additional treatment strategy. **CONCLUSION:** PNE in combination with physical therapy interventions proved to be superior to manual therapy, therapeutic exercise, or therapeutic activity alone in decreasing orofacial pain, improving temporomandibular joint range of motion, and improving craniomandibular function. Overall, while there is promising evidence supporting the efficacy of PNE for individuals with CMD, additional research is warranted to elucidate optimal intervention protocols and long-term outcomes. **ACKNOWLEDGEMENTS:** No funding contributed to the generation of this systematic review.

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PHYSICAL THERAPY INTERVENTIONS FOR TREATMENT OF POST-CONCUSSIVE HEADACHE: A SYSTEMATIC REVIEW

Bonhaus, K, Johnson, M, Rudnick, M; Grand Valley State University, Grand Rapids, Michigan

INTRODUCTION: To explore available physical therapy interventions used to treat post-traumatic headache and compare those to current physical therapy practices for management of post-traumatic headache (PTH).

METHODS: A systematic literature search was completed in accordance with the PRISMA guidelines¹⁴. Articles were included if written in English, published between 2004-2024, participants ≥ 10 years old, utilized an outcome measure, and included non-pharmacological interventions utilized in physical therapy practice to address post-traumatic headache. Sixteen articles were included following a search of PubMed, CINAHL Complete, SPORTdiscus, Web of Science Core Collection databases on June 29, 2023.

RESULTS: There were 16 articles included in which included three randomized controlled trials, three case series, seven case reports, and three pilot studies. No automation tools were used in the article screening or synthesis. Article data was extracted into a table individually by all three researchers. Interventions utilized to treat PTH varied with no reports of major adverse events and the majority of interventions resulted in a reduction of PTH symptoms. To assess each individual article's level of evidence, the Oxford Center for Evidence- Based Medicine (OCEBM)¹⁶ was utilized.

DISCUSSION: A patient specific approach for physical therapy interventions for patients with post-concussion were shown to improve their reports of headache symptoms with varying outcome measures demonstrating improvements.

CONCLUSION: PTH is a debilitating symptom following a concussion and restricts participation in academic, athletic, and social events. There are a wide variety of interventions and treatment techniques physical therapists may use to treat their patients suffering from PTH. While many of these treatment techniques have been deemed safe and effective in reducing PTH symptoms and severity, conclusive evidence cannot be extracted from this review due to the lack of heterogeneity of the studies that were included in this review.

ACKNOWLEDGEMENTS: No funding contributed to the generation of this systematic review.

RETURN TO PLAY DECISION MAKING BETWEEN FIRST YEAR DPT AND THIRD YEAR DPT STUDENTS: A PILOT STUDY TO ASSESS DPT PROGRAM CURRICULAR CONTENT. Adams JC, McGee CT, McGraw SJ, Sander TC; Grand Valley State University, Grand Rapids, MI.

INTRODUCTION: Proficiency in emergency response is a requirement of sports physical therapy (PT) practice and is important for physical therapists to be adequately prepared to respond to emergency situations and make appropriate return-to-play decisions when providing coverage for sporting and military training events. Due to individual program missions and priorities, entry-level Doctor of Physical Therapy (DPT) program curricula are highly variable regarding academic and experiential knowledge in sports PT. The Grand Valley State University (GVSU) DPT program is structured to produce generalist practitioners who are prepared to practice PT in any setting. Currently, no research has assessed perceived preparedness or appropriate decision making in urgent and emergent conditions within DPT curricula. The purpose of this study was to evaluate differences between first- and third-year GVSU DPT students for perceived preparedness and appropriate decision-making in the management of urgent and emergent conditions typically encountered in sports PT practice. **METHODS:** This study is a pilot study with a cross-sectional design, utilizing an online survey. Third-year (n=28) and first-year (n=23) GVSU DPT students completed the survey. Group responses to questions of perceived preparedness were compared using the Fisher's exact test with Monte Carlo estimates. Frequency of appropriate responses between groups on case-based questions were compared using Fisher's exact test. Independent t-tests were performed to compare overall perceived preparedness and overall performance by year group on case-based questions. Previous studies utilizing the same 2 sets of 17 questions used a binary system where if 75% or more respondents in a group answered appropriately then the group was considered prepared. We utilized this system to further compare potential differences between perceived preparedness and performance on case-based questions, placing the two groups into two categories: over/under 75% prepared, and over/under 75% appropriate responses. **RESULTS:** Third year DPT students expressed significantly greater overall perceived preparedness than their first-year peers, ($p < 0.001$). There were no significant differences regarding overall appropriateness of response ($p = 0.1690$) between the two groups. However, there was a significant difference found on 12 of 17 perceived preparedness categories ($p < 0.05$) between year groups, with third-year students feeling more prepared to manage those conditions from the specific 12 categories. Only one of 17 case-based scenario questions yielded a significant difference between year groups (fatigue/dehydration: $p = 0.0022$). **DISCUSSION:** Third-year DPT students may have the knowledge to manage injuries but may not be able to appropriately manage acute on-field injuries. More laboratory or clinical experience is required to bridge the gap between third-year knowledge and appropriate application of knowledge. GVSU DPT curricular content may have influenced increased levels of perceived preparedness when managing acute sports injuries or emergent conditions. **CONCLUSION:** The GVSU DPT program curriculum may have increased perceived preparedness in third-year DPT students. However, there is not enough evidence to conclude that program curricula resulted in an increase in appropriate responses on urgent/emergent cases presented on the survey.

PREVALENCE OF LOW ENERGY AVAILABILITY IN U.S. COLLEGIATE ATHLETES: A SYSTEMATIC REVIEW.

Seifferlein K, Kennedy A, Sibole S, Stickler L. Grand Valley State University.

INTRODUCTION: Low energy availability (LEA) is central in the definition of conditions used to describe the impact of an energy deficit in athletes including the female athlete triad, male athlete triad, and relative energy deficiency in sport. LEA conditions can contribute to broad negative impacts on an athlete's physical health, mental health, and performance. Currently, there is not an established prevalence of LEA in U.S. athletes. Thus, the purpose of this study was to conduct a systematic review to determine the prevalence of LEA in US intercollegiate NCAA or NAIA athletes. Secondly, this review aimed to compare the potential difference in the prevalence of LEA in male and female athletes. Given sufficient data, the following research questions were to be addressed 1) Does the prevalence of known secondary health issues for athletes with LEA differ from their peers without LEA? 2) Does the prevalence of LEA in athletes vary per sport? **METHODS:** Five databases (PubMed, CINAHL, SPORTDiscus, Web of Science, and PsycINFO) were searched for peer-reviewed journal articles published between January 1, 2013, to May 30th, 2023. Articles eligible for inclusion met the following criteria: 1) investigated U.S. intercollegiate athletes participating in an NCAA or NAIA-sanctioned sport, 2) investigated the prevalence of LEA in participants using self-reported or objective outcome measures, 3) were peer-reviewed, and 4) were a randomized control trial, observational study, prospective cohort study, or cross-sectional cohort study. Level of evidence was assessed using the Oxford Centre of Evidence-Based Medicine 2011. Rigor was assessed using the 11-point scale as described by Rostron or with the Newcastle Ottawa Scale. Data was abstracted for each article in a standardized fashion.

RESULTS: The final article count for data extraction and analysis was ten. Prevalence of LEA in athletes varied greatly ranging from 15% to 100% with six studies reporting 50% or greater prevalence. There was limited data on the prevalence of LEA in male athletes, but it ranged from 15% to 45%. In females, the prevalence of LEA ranged from 26.3% to 100%. Comparison between sports was difficult due to differences in reporting methods. Limited data was available on secondary complications with only half the articles including information on secondary health complications. However, articles reporting on secondary health impacts found connections between LEA and hypertension, hormonal menstrual dysfunction, eating disorder risk, body dissatisfaction/drive for thinness, and metabolic adaptation.

DISCUSSION: The prevalence of LEA reported across the articles included in this systematic review ranged vastly and the methods for assessing and reporting LEA varied greatly. However, four of the ten articles reported prevalence numbers above 75%, suggesting LEA is common in athletes. Female athletes predominated the total participants, but similar significant rates of LEA in male athletes competing in the same sport were reported suggesting males and females may be similarly impacted by LEA. The secondary questions regarding sport and secondary conditions were unable to be fully answered.

However, the secondary complications that were reported demonstrate the importance of assessing for additional health issues in those with LEA. Sport reporting varied greatly and while most participants where athletes from sports involving high amounts of running, sports such as equestrianism, volleyball, and competitive cheer also demonstrated higher LEA prevalence at 50% or above. **CONCLUSION:** Despite the variations in reporting, it appears LEA may be high in both male and female collegiate athletes across a variety of sports; thus, it is important to screen to LEA in all athletes. A gold standard assessment is needed to standardize the literature on LEA and allow for better analysis.

IDENTIFICATION OF MYOFASCIAL TRIGGER POINTS: A METHOD COMPARISON STUDY DETERMINING AGREEMENT BETWEEN MANUAL PALPATION AND ULTRASOUND IMAGING

Bowman J, Bower V, Ralston M, Rose J; Grand Valley State University Grand Rapids, MI

INTRODUCTION: Myofascial trigger points (MTrPs), defined as hyperirritable spots within a taut band of skeletal muscle, are typically identified via palpation. MTrP palpation inter- and intra-rater agreement reliability is variable and operator dependent. A more objective diagnostic method for MTrP diagnosis is desirable. Guided ultrasound imaging (USI) has been used to identify potential MTrPs in muscle with mixed results. The purpose of this study is to determine the agreement between non-guided USI and manual palpation MTrP identification in the infraspinatus muscle. **METHODS:** Method-comparison study. Participants: 50 healthy participants between the ages of 18-30 consented to participate. Methods/Procedures: Following screening, a 10 cm x 12.5 cm hydrofilm grid with thirty 2 cm x 2 cm cells was placed over the infraspinatus. An experienced sonographer sequentially imaged each cell with B-mode USI, identifying cells consistent with previous MTrP description (uMTrP). Stiffness of all uMTrPs and 2 control cells was assessed via shear wave elastography. An experienced physical therapist, blinded to the USI results, then sequentially palpated each cell, identifying cells consistent with palpatory MTrP criteria (pMTrP). Pain pressure threshold (PPT) of all pMTrPs and 2 control cells was assessed. Statistical Analysis: Fuzzy Kappa spatial autocorrelation analysis was completed to determine agreement between methods related to MTrP specific cell location. Two-way ANOVA with random effects was used to assess differences in stiffness values between uMTrPs and control cells; and PPT values between pMTrPs and controls. **RESULTS:** Of the 44 participants who completed the study, 18 (41%) had at least 1 uMTrP; and 22 (50%) had at least 1 pMTrP. Fuzzy Kappa analysis showed no agreement ($K=0.015 \pm .067$) between methods in identifying cells with MTrPs. pMTrP sites demonstrated lower mean PPT values than controls ($p=0.0008$). uMTrP sites did not differ in relative stiffness compared to controls ($p=0.056$). **DISCUSSION:** The findings suggest that unguided USI does not identify hyperirritable taut bands of muscle identified via manual palpation. Consistent with previous findings, pMTrPs had significantly lower PPT than control areas. Inconsistent with previous findings, uMTrPs were not stiffer than controls. These findings indicate that each method found some form of unrelated connective tissue lesion. Potential explanations for discrepancy include lack of standard MTrP USI criteria and lack of standard MTrP palpation criteria. Further research is needed to determine if unguided USI can be used to independently detect MTrPs. **CONCLUSION:** This study found no inter-method agreement between manual palpation and unguided ultrasound imaging for MTrP diagnosis. The rigorous methodology and robust sample should be considered when comparing these results to previously published reports. **ACKNOWLEDGMENTS:** None.

THERAPEUTIC DRY NEEDLING FOR LOWER EXTREMITY MUSCULOSKELETAL PATHOLOGY AND ITS EFFECTS ON FUNCTIONAL OUTCOMES: A SYSTEMATIC REVIEW

DeLong LA, Hanes S, Vostad KA, Hoogenboom BJ, Metcalf E; Grand Valley State University, Grand Rapids, MI

INTRODUCTION: An increasing number of physical therapists are using Therapeutic Dry Needling (TDN) to treat musculoskeletal conditions. While research has found TDN to be successful in pain modulation, less research has been conducted to determine the effectiveness of TDN for improving musculoskeletal function. The purpose of this systematic review was to examine the role of TDN on functional outcomes in patients with lower extremity musculoskeletal conditions. **METHODS:** CINAHL, PubMed, and Web of Science were searched with the assistance of a university research librarian using the terms “muscle”, “dry needling”, “lower extremity” AND “motor performance”. Randomized Controlled Trials (RCT’s), case control design studies, cohort studies, case series, and case reports published in English that included human subjects with a lower extremity musculoskeletal condition who were treated with TDN to determine the effect on functional outcomes and/or patient reported outcomes were included. A blind title and abstract review was completed independently by two separate researchers and any discrepancies were evaluated by a third author and eventually agreed upon by all researchers. Full text review was conducted in the same manner. Studies were assessed for level of evidence using the Oxford Center for Evidence Based Medicine Criteria (OCEBM). The PEDro scale was used to examine risk of bias for RCTs, the Newcastle Ottawa Scale was used to assess risk of bias for any non-randomized studies, and the Joanna Briggs Institute (JBI) Critical Appraisal Checklist was used to assess risk of bias for case reports and case series. **RESULTS:** The initial search returned 441 articles. After screening, 17 studies of various levels of evidence were included and were found to have low to moderate risk of bias. These studies provided evidence that TDN and Conventional Physical Therapy (CPT) both result in improvements in LE functional outcomes and patient reported outcomes over time. However, there is little evidence to conclude there are statistically significant differences in functional outcomes between patients treated with TDN and CPT. However, improvements in functional outcomes were seen specifically in subjects with knee tendinopathies across studies with various levels of evidence. **DISCUSSION:** Limited research exists on functional outcomes after TDN for treatment of soft tissue injuries and other MSK pathology in the LE’s. More research is needed utilizing performance-based and patient-reported outcome measures to discern the effects of TDN on LE function. **CONCLUSIONS:** Low to intermediate quality evidence exists suggesting knee function improves with both TDN and CPT; Good to excellent quality evidence does not demonstrate statistically significant improvements in function when comparing TDN to CPT alone, questioning the added benefit of TDN. While improvements were demonstrated in outcomes for patients with knee tendinopathy, these changes did not meet the Minimal Clinical Important Difference (MCID) and Minimal Detectable Change (MDC) values for the outcome measures, questioning the clinical significance of the effects of TDN.

STRATEGIES TO INCREASE UNDERREPRESENTED MINORITIES IN US REHABILITATION EDUCATION PROGRAMS: A SYSTEMATIC REVIEW

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INTRODUCTION: Diversity and inclusion are crucial in graduate-level rehabilitation therapy programs to ensure equitable healthcare delivery. Despite demographic shifts towards greater minority representation in the U.S., these fields lag significantly in diversity. Speech-language pathology has one of the lowest diversity rates among health professions, with occupational therapy and physical therapy also showing substantial underrepresentation. This lack of diversity restricts the pool of underrepresented applicants and poses challenges for both the healthcare industry and patient care. These disparities emphasize the urgent need for increased diversity within rehabilitation professions admissions to address the underrepresentation of minorities and enhance patient care outcomes. The purpose of this systematic review was to assess the impact of strategies to increase minority representation in graduate-level rehabilitation programs in the United States. **METHODS:** PubMed, ERIC, Web of Science, and CINAHL were searched using predefined terms. Inclusion criteria consisted of US-based studies on graduate rehabilitation programs with pre-post intervention data and diversity initiatives. Exclusion criteria excluded non-US studies, those lacking pre-post data, and non-English studies. Oxford Centre for Evidence-Based Medicine Levels of Evidence assessed study quality. Methodological rigor was evaluated using relevant appraisal tools, tailored to study designs. Using this approach, evidence on strategies influencing minority representation in graduate rehabilitation programs was synthesized. **RESULTS:** Of 495 studies, seven met the inclusion criteria. Studies investigated Occupational Therapy, Physical Therapy, and Speech-Language Pathology programs, totaling 185 academic programs at the doctoral (5) and master (4) levels. Interventions included mentorship, pipeline, holistic review, and exposure strategies. Mentorship programs demonstrated increased minority admissions with various initiatives such as webinars and faculty-led mentoring programs. The single pipeline programs reviewed displayed inconclusive data. Holistic reviews positively impacted minority admissions, focusing on non-traditional admission practices. Exposure strategies, like career fairs, increased underrepresented minorities (URM) enrollment in physical therapy programs. **DISCUSSION:** Implementing diverse initiatives highlights the need for a multifaceted approach in pre-admission and admission stages, crucial for promoting diversity, equity, and inclusion. Holistic review evaluates candidates comprehensively, while pipeline programs support underrepresented talent. Exposure strategies draw diverse applicants, and mentorship programs offer ongoing support. These efforts foster an inclusive learning environment, reflecting societal diversity and preparing graduates for diverse patient needs in their careers. **CONCLUSION:** Adopting multifaceted recruitment strategies is crucial for promoting diversity, enriching the educational environment, and improving healthcare outcomes by creating a workforce reflective of the population it serves.

THE EFFECTS OF SCOLIOSIS SPINAL FUSION ON PATIENT REPORTED PAIN AND QUALITY OF LIFE OUTCOMES

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INTRODUCTION: Scoliosis is a common condition in which an individual develops a lateral curvature of the spine in the coronal plane of 10 degrees or more¹. Spinal fusion is one of the most common surgeries performed for scoliosis correction, but in the past, patients experienced complications after surgery due to long periods of immobilization¹. In efforts to reduce these complications the concept of spinal fusion with pelvic fixation was introduced. When approaching this type of surgery, patients, and physical therapists, should know the short- and long-term effects of spinal fusion. Patients that choose surgery should be given clinical data of what their life could be like immediately after the surgery and years after. This study is designed to provide adult scoliosis patients clinical data on possible changes in both their physical function, pain levels, and overall well-being after corrective spinal fusion surgery.

METHODS: This study is an unblinded, non-randomized, controlled clinical trial. Participants included thirteen individuals from the greater Grand Rapids, Michigan area. Average demographics for participants were as follows: 63.9 years of age, 161.6 cm height, and 73.9 kg weight, with a female to male ratio of 11:2. All participants underwent spinal fusion surgery involving multiple levels of vertebrae in order to correct spinal deformities due to scoliosis. Participants were asked to fill out three outcome measures including the Oswestry Disability Index (ODI)³, Visual Analogue Scale (VAS), Short Form Survey (SF-36)³, and Scoliosis Research Society questionnaire (SRS-30)⁴ at baseline, 3-months post operatively, 6-months, 1-year, and 2-years respectively. A lower score on the ODI and VAS indicate improvements in function and pain, whereas a higher score on the SF-36 and SRS-30 indicates improvement in functional abilities. Data from these outcome measures were scored, organized, and analyzed using both Excel and StatsJMP statistical software to compare quality of life measures and pain levels prior to and post undergoing spinal fusion surgery. **RESULTS & DISCUSSION:** The average scores for the SRS-30 improved at each time interval following surgery, with the largest improvement occurring between baseline and 3-months post-surgery⁴ (67.5 to 96.5). There were improvements observed in many categories of the SF-36, with the largest improvements displayed in figure 1³. Average scores for the ODI decreased at each time interval, with the largest decrease occurring 3-months post-surgery (27.15 to 16.92)³. This trend was also apparent for VAS pain scores, with the largest decrease in average pain 3-months following spinal fusion (57.3% to 26.3%). The large range of scores at 6-months, 1-year, and 2-years post-surgery for these outcome measures provides evidence for the increased variance of outcomes following the spinal fusion procedure. This speaks to the idea that clinicians play a small role in the overall outcome of physical therapy. Factors such as program compliance and sociocultural factors may inhibit an individual's ability to successfully recover². Evidence for increased function following spinal fusion is provided by the significant improvement in SRS-30, ODI, and VAS scores 3-months following the procedure. In addition, it was difficult to draw conclusions from some of the categories on the SF-36 due to the limited number of responses available to participants. **SIGNIFICANCE:** The findings of this study help to determine the long-term effects that a spinal fusion procedure can have on an individual with scoliosis. Each individual will experience varying levels of pain and quality of life that may impact their ability to progress during rehabilitation. Our research also highlights the impact that sociocultural factors can have on an individual's outcomes following a spinal fusion procedure². This information could be utilized by practicing physical therapists to direct treatment towards areas of function that are commonly impacted following this procedure. These findings may also encourage physical therapists to seek assistance from additional healthcare providers when their patient is not progressing as expected. Limitations of our study include the subjectivity of the patient reported outcome measures, a small sample size, and the large variability of outcomes following surgery. **REFERENCES:** [1] Gummerson et al. (2010), *Skeletal Radiol* 939-942; [2] Miyagishima et al. (2017), *Phys Ther Res* 20: 36-43; [3] Glassman et al. (2006), *Spine J* 6(1) 21-26; [4] Kyrölä et al. (2019), *Disability and Rehabilitation* 43(1) 98-103

PHYSICAL THERAPY APPROACH FOLLOWING A SPONTANEOUS SPINAL EPIDURAL HEMATOMA: A CASE REPORT.

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BACKGROUND AND PURPOSE: The purpose of this case report is to assess the progress made through physical therapy in a patient following a spontaneous spinal epidural hematoma with the initial classification of ASIA B. Spontaneous spinal epidural hematomas (SSEH) occur when blood occupies the epidural space resulting in compression of surrounding tissues without a known traumatic or iatrogenic cause. **CASE DESCRIPTION:** A 36-year-old male presented to our outpatient clinic 56 days following the initial onset of his symptoms of a spontaneous thoracic hemorrhage at T12. He presented with bilateral impairments of sensation, decreased strength, proprioception, coordination and deep tendon reflexes. The patient presented with hypotonia throughout his lower extremities. He also had impaired bowel and bladder function. The planned interventions included therapeutic activity, gait training, manual therapy, wheelchair training, and therapeutic exercise. A variation of open and closed chain exercises was introduced to address his strength and coordination deficits. Decisions regarding orthotics alterations were made to optimize his function. Throughout treatment, the patient had back pain that we addressed by incorporating core stability exercises. These were all chosen to address current impairments and functional deficits. **OUTCOME:** The patient demonstrated improvements in his strength, balance, coordination and with functional tasks, allowing him to gain more independence and progress towards goals. The patient demonstrated an increase in motor function below his level of injury with more than half of his strength measurements being above a level 3. This indicated that his motor function would be considered motor incomplete and ASIA D. He was able to ambulate 800ft with the use of custom KAFOs and a FWW. He was also able to navigate 12 stairs with the use of bilateral railings and his orthotics and complete all transfers independently. His sensation continued to be diminished at the mid-thigh region and severely diminished below the knees. **DISCUSSION:** His improvements exceeded the expectations at the start of care, with his increased ability to perform functional activities and his motor and sensory deficits recorded as an ASIA D. Although we did see much improvement throughout his plan of care, there were not many quantitative objective measures taken from the initial evaluation to the time I worked with him while on my clinical affiliation, aside from walking distance. More objective outcome measures would have been useful to see progress and is something to consider with cases similar to this one to help guide treatment and track progress.

**PLATFORM PRESENTATIONS
TRACK A, SESSION 2**

EXPLORING LEARNING OUTCOMES THROUGH THE USE OF GAMIFIED POWERED MOBILITY IN CHILDREN: A NIH FUNDED CLINICAL TRIAL. Clark EL, Kincaid SA, Leatherberry SL, Quinn CR; Grand Valley State University, Grand Rapids, MI.

INTRODUCTION: The IndieTrainer system includes both a mobility device and an array of video-based gamified training modules designed to facilitate power wheelchair (PWC) skills acquisition. The IndieTrainer system temporarily converts a child's manual wheelchair (MWC) into a PWC, thereby optimizing the child's mobility experience and providing children with neurodevelopmental conditions with the opportunity to learn and practice PWC skills in their own MWC. The purposes of this study were to explore: (1) Using the IndieTrainer system to assist children with cerebral palsy (CP) or similar conditions to develop PWC skills; and (2) Parent satisfaction with the IndieTrainer system. **METHODS:** We conducted an open label, single-arm clinical trial involving: (a) Pre-intervention testing (T0); (b) A 3-week intervention period consisting of two, 60-minute PWC skills training sessions per week; (c) Post-intervention testing immediately after the intervention period (T1); and (d) A single session follow-up/retention trial held 4 weeks after the completion of the intervention period (T2). Inclusion criteria were children ages 3-21 years with cerebral palsy or other similar conditions who were unable to functionally ambulate or self-propel a manual wheelchair. Exclusion criteria included having a progressive condition or already having an individually prescribed PWC. Outcome measures included the Assessment of Learning Powered mobility use (ALP), the Wheelchair Skills Checklist (WSC), the Canadian Occupational Performance Measure (COPM), and the Client Satisfaction Questionnaire-8 (CSQ-8). Outcomes were assessed at baseline (T0), immediately post-intervention (T1), and at a single follow-up session (T2). **RESULTS:** 25 child/parent dyads participated in the study. Between T0 - T1, statistically significant differences ($p < 0.0001$) were achieved with large effect sizes in mean ALP and WSC scores (ALP: $d=3.14$; WSC: $d=3.25$) and clinically significant improvements in ALP scores. Changes in mean COPM performance and satisfaction scores were also statistically significant ($p < 0.0001$) with large effect sizes [Performance: $d=4.66$; Satisfaction: $d=3.24$]. Each child participant also achieved clinically significant improvements in all COPM Performance scores. The mean total CSQ-8 score at T1 was 31.52/32. At T2, all children maintained or improved their T1 ALP and WSC scores. **DISCUSSION:** Similar to previous studies conducted through the Grand Valley Power Mobility Project, these 25 child participants appeared to show clinically significant improvements in PWC skills following PWC skills training. Improvements in COPM performance scores suggest that parent participants perceived their child made improvements towards their individualized goals. Each child participant maintained or improved their ALP score between T1 and T2, suggesting that these children maintained their understanding and execution of their power mobility skills over the follow-up period. **CONCLUSION:** Despite undergoing only 6 hours of PWC skills training over a three-week period, all 25 child participants demonstrated clinically significant improvements in PWC skills and maintained or improved their ALP and WSC scores at follow-up. This study provides initial support for the usability and feasibility of the IndieTrainer system. Future, larger scale studies using more rigorous research designs are indicated. **ACKNOWLEDGEMENTS:** This study was funded by the National Institute of Child Health and Human Development (NIH-R44HD103522). The Clinical Trial was registered on clinicaltrials.gov (NCT05473182).

**SKILLS ON WHEELS AT HOME – BUILDING ESSENTIAL MANUAL
WHEELCHAIR SKILLS FOR CHILDREN: A CASE SERIES.** Kaspala SN, Mihelic AM,
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BACKGROUND AND PURPOSE: Adequate manual wheelchair (MWC) skills can play a crucial role in promoting independence, confidence, and overall quality of life for children with disabilities. The importance of providing MWC skills training has been widely recognized in adult populations, however, there is a noticeable gap in the provision of MWC skills training in pediatric populations. Consequently, research surrounding the efficacy of MWC skills training programs tailored to children is limited. The purpose of this case series was to describe the implementation and outcomes of a home-based pediatric MWC skills training program. **CASE DESCRIPTION:** Four child-parent dyads participated in this case series. The gender, age, and diagnosis of the child participants were as follows: 7-year-old female with spastic quadriplegic cerebral palsy; 14-year-old male with cerebral palsy; 5-year-old male with spina bifida; and a 7-year-old male with athetoid cerebral palsy. Parents, and children if applicable based on their age and communication ability, completed the following tests and measures pre- and post-intervention: The Canadian Occupational Performance Measure (COPM), the Wheelchair Skills Test-Questionnaire (WST-Q), and a semi-structured qualitative interview. Based on examination findings, individualized interventions were developed and tailored to meet the interests, needs, and goals of each child-parent dyad. Following the pre-intervention testing, the case series involved a total of four, 60-minute intervention sessions, and concluded with post-intervention testing. All case series activities took place either within the child's home or in community settings based on the parent/child goals to promote saliency and transference of MWC skills. **OUTCOMES:** For all participants, differences in pre- and post-intervention for all COPM performance scores showed a positive clinically significant difference (increase of ≥ 2 points), while COPM satisfaction scores showed an overall positive change. All WST-Q performance and confidence scores also showed a positive change. All post-intervention semi-structured interviews outlined subjective improvements in each child's MWC skill performance and their overall confidence. **DISCUSSION:** The inclusion and exclusion criteria outlined in this case series yielded a wide variety of child MWC users, with various skill sets, communication skills, and mobility preferences. All participants in this case series demonstrated an improvement in scores of MWC skills performance, confidence, and frequency, as well as increased perceived independence following intervention sessions. Future research on this topic should involve more intervention sessions at regular and more frequent intervals. This study demonstrated the need for conducting a large-scale study emphasizing home or community based MWC skills training for children.

TINY DRIVERS, BIG DECISIONS: PARENTAL PERCEPTIONS AND EXPERIENCES OF POWER MOBILITY DEVICE TRIALS FOR YOUNG CHILDREN. Doty J, Beers L, Erlenbeck A, Chung KJ, Herrenkohl M, Sloane BM, Logan SW, Feldner HA, Kenyon, LK; Grand Valley State University, Grand Rapids, MI; Oregon State University, Corvallis, OR; University of Washington, Seattle, WA.

INTRODUCTION: Accessibility to mobility at a developmentally appropriate age is crucial for young children to increase participation, improve social skills, and augment cognitive development. The purpose of this study was to explore parental/caregiver (parent) perceptions and experiences across a 16-week study involving their children's use of 2 pediatric power mobility (PM) devices: a modified ride-on car (mROC) and the Permobil Explorer Mini (EM).

METHODS: Data for this phenomenological qualitative study were gathered as part of a multi-site randomized, counterbalanced AB crossover clinical trial, wherein all child participants used PM device A (EM) and PM device B (mROC) for eight-weeks each, across a 16-week study.

Trained researchers conducted in-person, audio recorded phenomenological interviews at baseline (T0), post-intervention period 1 (T1), and post-intervention period 2 (T2). Child/parent participant dyads were randomly assigned to either the EM-mROC (AB) or the mROC-EM (BA) device-use sequence group. Interviews were transcribed and analyzed using the constant comparison method. Inclusion criteria for child participants included ages 12-36-months-old, having a cerebral palsy diagnosis (CP) or at risk for CP. Inclusion criteria for parent participants included being ≥ 18 years of age and being conversationally proficient in English. **RESULTS:** 24 child/parent participant dyads (8 from each site) partook in the study. Data from 72 interviews were included in the analysis (24 transcripts at each of the 3 timepoints). The following unique themes emerged: T0 - 'Anticipation', 'Adjustment', and 'Recognizing Strengths'; T1 - 'Benefits and Barriers', 'Expectations', and 'Importance of Device Trials'; T2 - 'One Size Doesn't Fit All', 'Environments Matter', and 'Enabling Participation'. At T0, parents focused on the anticipated adjustment period for their child, while also recognizing their child's positive attributes. At T1, after trialing their first device, parents discussed benefits of PM device use, such as increased access to environment and improved participation, and barriers such as lack of time and device size. Parents also discussed excitement for trialing the second device and noted the importance of PM device trials. At T2, parents discussed the importance of PM device access and how PM devices provides their children with a mobile learning environment, allowing them to explore and engage with their environment. Parents also discussed their need to modify PM devices to meet their child's needs. **DISCUSSION:** Study findings emphasize the importance of providing families with PM device options. Parents appeared to appreciate the opportunity to trial each of the PM devices in their home and other natural environments without having to purchase the devices. Parents further recognized both barriers and benefits to each device related to their specific environment. They further indicated that their device preferences related in part to their child's specific abilities, the characteristics of each device, and their identified family goals and expectations. **CONCLUSIONS:** This study provides insights to assist clinicians in implementing the principles of On Time Mobility and highlights the variety of ways in which PM use can positively impact socialization and participation for young children with CP.

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PLATFORM PRESENTATIONS
TRACK B, SESSION 2

THE OUTPATIENT PHYSICAL THERAPY MANAGEMENT OF A 40-YEAR-OLD PATIENT WITH A GRADE 2 HAMSTRING STRAIN RESULTING FROM A SLALOM WATER SKIING ACCIDENT: A CASE REPORT. McGettigan, P, Shoemaker, M; Grand Valley State University, Grand Rapids MI.

BACKGROUND AND PURPOSE: Hamstring strains are a common sport-related injury with good return to play outcomes, particularly in sprinting athletes. However, a mechanism of injury less commonly reported are hamstring strains as the result of stretching, seen in slip-and-falls, dancers, and water skiers. The purpose of this case report is to add to the sparse evidence surrounding the physical therapy rehabilitation of patients with a stretch-type hamstring strain to improve outcomes and length of recovery. **CASE DESCRIPTION:** The patient was a married 40-year-old male mid-level manager at a footwear company with grade 2 muscle tearing of semimembranosus, semitendinosus, and gracilis, confirmed on magnetic resonance imaging, after a fall while water skiing. He presented to physical therapy with significant ecchymosis, edema, decreased range of motion and strength, impaired gait, and decreased sitting ability. He was otherwise healthy, active and motivated to return to full participation in his regular work, home, and recreational activities. Physical therapy interventions focused on returning full active range of motion, lower extremity strength and control, and higher-level agility and sports skills. **OUTCOMES:** The patient increased his Lower Extremity Functional Scale score from 53/80 to 67/80, strength and range of motion returned to prior level, and he was able to tolerate sitting for prolonged periods with minimal increases in stiffness. He was not yet confident in sprinting and agility skills by discharge, but he gained self-confidence in managing his remaining deficits and was able to participate in his daily life without pain or limitations. **DISCUSSION:** The patient experienced low back pain during his episode of care, which may have impacted his therapeutic outcomes. Impaired body mechanics during gait, indoor cycling, or poorly managed exercise volume within the patient's regular exercise routine were thought to have contributed to the patient's secondary symptoms. Thus, a physical therapy plan of care must consider these elements to remain on the intended trajectory and improve therapeutic outcomes. Future research should focus on patients with stretch-type hamstring strains to improve outcomes. **ACKNOWLEDGEMENTS:** No financial contributions to declare. Thank you to my faculty advisor, Dr. Mike Shoemaker, PT, DPT, PhD, GCS, for his guidance and support, and to my clinical instructor, Doug Elliot, PT, MPT, COMT, OCS, for his expertise as an evidence-based practitioner.

PHYSICAL THERAPISTS' PERCEPTIONS OF DRY NEEDLING: A QUALITATIVE STUDY. Rose J, Oakes S, Stickler L, Curtis B, Dugan A, Smith A; Grand Valley State University, Grand Rapids, MI

INTRODUCTION: Dry needling (DN) is a skilled intervention involving the insertion of a dry (non-medicated), solid, filiform needle into connective tissue for the treatment of pain and movement disorders. The use of DN as a physical therapy (PT) intervention has recently increased. The evidence-based practice (EBP) model considers the best available research, clinician expertise and patient values to achieve optimal patient outcomes. A growing body of research suggests DN is effective for short-term pain reduction across multiple body regions; and that patients value the treatment. Less is known about clinician's experience. The purpose of this study is to explore physical therapists' personal experiences using dry needling techniques as part of their work treating individuals with musculoskeletal impairments. **METHODS:** A general inductive approach using semi-structured interviews was used to answer the following questions: 1) How do therapists perceive the DN training they received?; 2) How do therapists perceive the inclusion of DN has impacted their clinical practice?; and 3) How do therapists perceive DN fits into the EBP model? **Subjects:** Physical therapists with at least 1 year of experience and who were certified and currently incorporating DN into practice were recruited via email. **Methods/Procedures:** 31 physical therapists were screened and 16 met study criteria and agreed to participate. These 16 therapists from 9 US states were interviewed using semi-structured Zoom interviews that included 9 questions with follow-up questions if necessary. **Statistical Analysis:** Responses were analyzed using a general inductive analysis method. **RESULTS:** Data saturation was achieved with 16 participants. The major themes identified relating to research question 1 include training experience variability and science-based emphasis of training (subthemes included anatomy and pain neuroscience focus). The theme that emerged relating to question 2 was a strong perceived value for clinical practice including patient outcomes, therapist outcomes, and practice outcomes. The major theme identified relating to research question 3 was an emphasis on clinician experience and patient values. Member checks conducted at study conclusion support trustworthiness of results. **DISCUSSION:** Therapists found their DN training to be generally effective for learning appropriate procedures, but they noted variability dependent on course related to technique, clinical applicability, and safety considerations. All agreed that DN is a valuable treatment modality that leads to improved efficacy and efficiency. Overall, the therapists indicated that their personal experiences and patient values were more influential in their decision to utilize DN as an intervention compared to empirical research. DN was likened to previous "new to PT" interventions like joint manipulation, where efficacy was acknowledged despite comprehensive empirical validation. Research limitations include the recruitment of active DN practitioners which might have biased outcomes and lack of full geographic representation. **CONCLUSIONS:** Physical therapists certified in DN perceive it to be an effective and efficient adjunctive intervention that contributes to improved outcomes in patients with connective tissue impairments.

CONSERVATIVE MANAGEMENT OF CHRONIC ACNES IN THE CONTEXT OF A CASH-BASED PHYSICAL THERAPY PRACTICE: A CASE REPORT Hernandez-Morales EZ, Chesser BT; Grand Valley State University, Grand Rapids, Michigan

BACKGROUND AND PURPOSE: As the prevalence of chronic pain continues to grow, research has found that many physical therapists and other healthcare providers lack the necessary knowledge to effectively manage and treat patients with chronic pain. The prevalence of chronic abdominal wall pain ranges from 5% to 67%. Acute Cutaneous Nerve Entrapment Syndrome (ACNES) is a condition characterized by the entrapment or compression of cutaneous nerves in the abdominal wall. The purpose of this case report was to describe the conservative treatment of chronic ACNES and discuss the importance of chronic pain education in the context of an outpatient, cash-based, physical therapy private practice. **CASE DESCRIPTION:** The patient was a 61-year-old female with a 17-year history of chronic ACNES seeking pain management services. The patient's history included diagnosis of celiac artery compression syndrome, food sensitivities, intermittent low back pain, and report of multiple traumatic life events over the course of her abdominal pain. The patient presented to the clinic specifically requesting dry needling (DN) and photobiomodulation, class VI laser therapy (LT), which were advertised by the clinic on the Internet. The patient was seen twice a week for a total of 11 visits. Treatment sessions consisted of DN performed by a DN-certified physical therapist followed by LT using the Summus Horizon Laser Device applied by a technician under the supervision of a PT. **OUTCOMES:** Following treatment sessions one through seven, the patient reported a minimal change in her pain. Following treatment sessions seven through nine, she reported a 60-75% decrease in pain a couple of hours after treatment that lasted about 48 hours before returning to baseline pain. The online Rand 36-Item Short Form Health Survey (SF-36) was administered before the third session and three weeks following the last session. Results indicated slight changes (positive and negative) across 5 domains resulting in a 14% drop overall. **DISCUSSION:** The patient concluded interventions were ineffective in reducing her abdominal pain or improving her ability to perform daily activities and discontinued services after experiencing an intense flare-up of abdominal pain while shopping at a market. Chronic pain education and interventions were lacking in the plan of care. Based on survey research, pain education is variable across graduate physical therapy education programs and among practicing clinicians, with many reporting a lack of confidence when it comes to treating chronic pain conditions. More research is needed on the incorporation of current pain education and interventions and conservative treatment options for physical therapy management of chronic ACNES.