UW Medicine
DEPARTMENT OF
REHABILITATION MEDICINE

2024 ABSTRACT COMPENDIUM

DPT CAPSTONE SYMPOSIUM

CLASS OF 2024

June 6th , 2024

9:00 AM – 3:00PM

UW Center for Urban Horticulture

UW Medicine
DEPARTMENT OF REHABILITATION MEDICINE

Class of 2024 DPT Capstone Symposium
Thursday, June 6, 2024

9:15- 9:30: Check-in
9:30 – 9:45: Welcome

Room NHS Hall A

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Grace Barker	Nurturing Bonds and Balancing Risk: A Case Report in the Therapeutic Alliance and the Management of Fall Risk in an Older Adult	Patti Matsuda
10:15 - 10:30	Zachary Church	Inpatient rehabilitation physical therapy effects of high intensity gait training on contraversive pusher syndrome: A case report.	Patti Matsuda
10:30 - 10:45	Helen Liu	Physical Therapy Management of Adult Female with Complex Lower Extremity Pathology and Fall Risk: A Case Report	Ellie Ostrand
10:45 - 11:00	Abel Nigussu	Efficacy of Physical Therapy Management on Polymyositis	Megan Scudder
11:00 - 11:15	***Break***		
11:15 - 11:30	Sophia Lowe Rodriguez	Physical Therapy Management of a Patient in Outpatient Physical Therapy with Acute Exacerbations of Chronic Inflammatory Demyelinating Polyneuropathy.	Stacia Lee
11:30 - 11:45	Michael Hall	Persistent Post-Concussion Syndrome Following Concussion With Complications Due to a Motor Vehicle Accident in a Male Adult	Brooke Lindsley
11:45 - 12:00	Amphone Rasasombath	Exploring School-Based Physical Therapy for a Child with Cerebral Palsy	Torey Gilbertson
12:00 - 12:15	Bing Gao	Outpatient Physical Therapy Management for a Child with Hirschsprung's Disease: A Case Report.	Lin-Ya Hsu
12:15 - 12:45	***Lunch***		
12:45 - 1:00	Lauren Bachman	Transcutaneous Spinal Cord Stimulation Improves Spasticity, Mobility, and Activity in Children with Cerebral Palsy	Chet Moritz Heather Feldner
1:00 - 1:15	Madeline Herrenkohl	Qualitative Analysis of Caregiver Perspectives Comparing the Permobil® Explorer Mini and a Modified Ride-On Car	Heather Feldner
1:15 - 1:30	Audrey Lynn	Effects of Powered Mobility Intervention on Development and Learning Outcomes in Young Children with Disabilities	Heather Feldner
1:30 - 1:45	Kiana Keithley	Caregiver's perception of young children's need for and capabilities using powered mobility	Heather Feldner
1:45 - 2:00	***Break***		
2:00 - 2:15	Lindsey Jouett	Up and Down: Effects of Partial Bodyweight Support on Social and Environmental Interaction in Infants With Down Syndrome	Heather Feldner
2:15 - 2:30	Anyssa Ruiz	The Effects of Treadmill Training Alongside Task-Specific Training on Gross Motor Function for a Child with Hypotonic Cerebral Palsy and a Rare Genetic Condition	Meg Whitney

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Room NHS Hall B

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Kylene Sutton	Rehabilitation of a Tibial Plateau Fracture in a Patient who delayed Physical Therapy Services	Ellie Ostrand
10:15 - 10:30	Maxwell Ngo	Chronic Physical Therapy Management of a Patient with Ulnar Neuropathy and Complex Medical Factors	Megan Scudder
10:30 - 10:45	Tatum Wong	Integration of Cognitive Functional Therapy into Physical Therapy Management for a Patient with Chronic Low Back Pain	Janis McCullough
10:45 - 11:00	Whitney Butler	Characteristics Associated with Symptomatic Segmental Hypermobility of the Cervical Spine in Patients with Neck Pain	Sarah Kaiser Sean Rundell
11:00 - 11:15	Break		
11:15 - 11:30	JD Jones	A Clinical Analysis of Blood Flow Restriction Training for Analgesia and its Impact on Force Production in the Post-Anterior-Cruciate Ligament Reconstruction Athlete	Murray Maitland
11:30 - 11:45	Kelsey Japp	Physical Therapy Management of a 23-year-old Female with Second Revision of ACL Reconstruction: A Case Report	Kathleen Cummer
11:45 - 12:00	Briana Heng	Physical Therapy Management following Anterior Cruciate Ligament Reconstruction with Internal Bracing and Quad Tendon Autograft: A Case Report	Kathleen Cummer
12:00 - 12:15	Angela Laureta	Hypophosphatemic Rickets in Young Adults: Surgical Intervention and Multidisciplinary Approach to Care: A case report	Ellie Ostrand
12:15 - 12:45	***Lunch***		
12:45 - 1:00	Madeleine Underwood	Rehabilitation of Bilateral Patellar Tendon Repairs: A Case Study	Laura Johnstone
1:00 - 1:15	Angelo Hynds	Effects of Sport-Specific and Delayed Initiation of Rehabilitation on a High-Level Rugby Athlete Following Medial Patellofemoral Ligament Reconstruction: A Case Study	Michelle Cangialosi
1:15 - 1:30	Tim Song	Cervicogenic Headache in a Patient with Long COVID: A Physical Therapy Approach	Gretchen Deutschlander
1:30 - 1:45	Reanna Marquez	Physical Therapy Management for a Patient Presenting with Tensor Fascia Latae Pain	Janis McCullough
1:45 - 2:00	***Break***		
2:00 - 2:15	Emily Geranen	Physical Therapy Management Status Post Reverse Total Shoulder Arthroplasty: A Case Report	Murray Maitland
2:15 - 2:30	Sergey Datskiy	Physical Therapy Evaluation and Treatment of a patient with Vertebral Artery Dissection and Chronic Cervicogenic Somatic Tinnitus after a Motor Vehicle Accident: A Case Report	Janis McCullough
2:30 - 2:45	Eugenia Chui	Complex Hip Pain with Functional Femoroacetabular Hip Impingement and Pelvic Floor Hypertonicity Considerations	Molly Gries
2:45 - 3:00	Kevin Wu	The Importance of Comprehensively Integrating the Biopsychosocial Model when Establishing Care with the Post-Operative Patient	Adam Babitts

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Room NHS Hall C

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Haley Coen	Transcutaneous Spinal Stimulation Improves Exoskeleton Assisted Walking in Spinal Cord Injury: A Pilot Study	Chet Moritz
10:15 - 10:30	Keith Pike	Impact of Biopsychosocial Factors and Physical Therapy Management of a Patient with an Acute Ischemic Left Pontine Stroke	Lisa Diller
10:30 - 10:45	Roozbeh Katiraie	A Case Study Report Reviewing Physical Therapy Treatment of a Patient with Parkinson's Disease in Inpatient Rehabilitation	Kate Rough
10:45 - 11:00	Maia Chin	A Case Study of Treating Functional Neurologic Disorder with Intensive and Interdisciplinary Rehabilitation Therapies	Kate Rough
11:00 - 11:15	***Break***		
11:15 - 11:30	George Gay	Impact of the COVID-19 Pandemic on Older Adults with Bothersome Pain	Sean Rundell
11:30 - 11:45	Minha Park	The treatment of a complex patient with muscle weakness due to COVID-19 infection	Kurt Williams
11:45-12:00	Erica Kendall	Physical Therapy Management of Hepatopulmonary Syndrome in the Acute Care Setting	Megan Scudder
12:00-12:15	Jason Chan	Gait Analysis and Functional Testing of a Novel Rat Model for Duchenne Muscular Dystrophy	Beth Brown
12:15 - 12:45	***Lunch***		
12:45 - 1:00	Brenna Lanton	The Prevalence of Stress Urinary Incontinence is Higher in Women with the Chronic Interstitial Lung Disease Lymphangioleiomyomatosis (LAM) Compared to the General Population	Beth Brown
1:00 - 1:15	Eliseo Veras-Tobas	An mHealth Exercise Intervention Increases Physical Activity and Quality of Life in Idiopathic Pulmonary Fibrosis	Beth Brown
1:15-1:30	Marion Paetznick	Pulse Oximetry Self Monitoring During Exercise, Enhances Perceived Safety, Autonomy and Usability in Idiopathic Pulmonary Fibrosis	Beth Brown & Claire Child
1:30 - 1:45	Michael Fairchild	Physical Activity in Obese Individuals with Type 1 Diabetes	Kathleen Cummer
1:45 - 2:00	***Break***		
2:00 - 2:15	Raphael Enrico	Skilled nursing facility physical therapy treatment following lumbar decompression & fusion for radiculopathy secondary to lumbar stenosis and spondylolisthesis: A case report.	Kurt Williams
2:15 - 2:30	Serra Shelton	Post-Acute Physical Therapy Treatment of Critical Illness Polyneuropathy in a Skilled Nursing Facility	Mark Nelson
2:30 - 2:45	Anjella Alejo	Physical Therapy Management of Lance Adam's Syndrome following Cardiac Arrest: A Case Study	Mark Nelson

Abstracts and accompanying references are compiled by project type, and then alphabetically by last name of DPT students

Research Projects

Case Report

Transcutaneous Spinal Cord Stimulation with Short-Burst Interval Locomotor Treadmill Training Improves Spasticity, Mobility, and Activity in Children with Cerebral Palsy

Lauren Bachman

Background and Purpose: Transcutaneous spinal stimulation (tSCS) combined with intensive locomotor treadmill training lacks extensive examination as an intervention for children with cerebral palsy (CP), who demonstrate similar neuromuscular impairments such as spasticity and decreased locomotor coordination. Single session tSCS improves muscle coordination, but its effects on spasticity and self-reported gait outcomes when combined with long-term training remain unknown. In this study, we combined tSCS with Short-burst Interval Locomotor Treadmill Training (SBLTT) to 1) quantify the effects of tSCS+SBLTT on spasticity of key lower extremity muscles of children with CP; and 2) understand caregiver and child-reported perceptions of tSCS and SBLTT intervention on mobility and ADLs.

Participants: 4 children (4-13 years), with CP, GMFCS Level I-II, and their caregiver. **Materials/Methods**: This prospective cross-over study assessed spasticity using summed modified Ashworth scale (MAS) for bilateral hamstrings, quadriceps, gastrocnemius, and soleus. Caregiver and child perceptions of ADL and mobility domains of the Gait Outcomes Assessment List (GOAL) were collected. Children completed two intervention phases: SBLTT only and tSCS+SBLTT with assessment taken at baseline, pre-, mid-, and post intervention over 8-12 weeks, and a 3-month follow-up. MAS scores were compared using t-tests, and GOAL with descriptive statistics.
Results: tSCS+SBLTT significantly improved spasticity scores ($p<0.001$) and remained at follow-up. Mean spasticity scores reduced significantly following tSCS+SBLTT (11 points) versus SBLTT only (4 pts). GOAL-Child and GOAL-Parent ADL scores improved more with tSCS+SBLTT (9.03 pts, 3 pts) versus SBLTT only (3 pts, -1 pt), respectively. Similarly, mobility scores improved more with tSCS+SBLTT (2.33 pts, 2.5 pts) versus SBLTT only (0.33 pts, 1.75).
Conclusion: tSCS+SBLTT reduced spasticity more than SBLTT alone. Both caregiver and child's perception of ADLs and mobility improved greater with tSCS+SBLTT. tSCS+SBLTT serves as a non-invasive means to reduce spasticity and improve perceived mobility and ADLs in children with CP.

References:

1. Bjornson, K. F., Moreau, N., & Bodkin, A. W. (2019). Short-burst interval treadmill training walking capacity and performance in cerebral palsy: a pilot study. *Dev Neurorehabil*, *22*(2), 126-133. https://doi.org/10.1080/17518423.2018.1462270
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Characteristics Associated with Symptomatic Segmental Hypermobility of the Cervical Spine in Patients with Neck Pain

Whitney Butler

Purpose: This study's purpose was to identify characteristics associated with manual findings of symptomatic segmental hypermobility in the cervical spine.
Subjects: 161 patients with neck pain.
Materials/Methods: We performed a cross-sectional study using electronic medical records. We reviewed 223 charts with initial examinations between 1/2021 and 12/2022 for eligibility criteria. Eligible charts were abstracted for demographics, medical history, subjective symptoms, and objective measures of hypermobility. The primary outcome was presence of a symptomatic, hypermobile segment. We used descriptive statistics and logistic regression adjusted for age and sex for analysis. **Results:** Mean age (standard deviation) was 40.9 (12.3) years, and n=122 (75.8%) were female. There were n=156 (97%) with any hypermobility identified. While there were n=61 (38%) with both hypermobility and palpable tenderness at the same segment. The most common cervical spinal levels with hypermobility identified were C2-3 (n=141, 88%), C6-7 (n=64, 40%) and C5-6 (n=58, 36%), with n=47 (29%) reporting C2-3 as the primary level that reproduced symptoms. The most common subjective findings include a history of macro-trauma (n=119, 74%), history of microtrauma (n=75, 47%), reported unilateral headaches (n=69, 43%), and periscapular pain pattern (n=101, 63%). The subjective finding of unilateral occipital or frontotemporal headaches was the only finding significantly associated with symptomatic cervical hypermobility (Odds Ratio=2.44, 95% CI: 1.21 to 4.94; p=0.013). **Conclusion:** For patients complaining of neck pain, the report of a unilateral headache was associated with symptomatic hypermobility of the cervical spine. Future studies with standardized data collection are required to identify the symptom presentation of CCSI.

References:

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Gait Analysis and Functional Testing of a Novel Rat Model for Duchenne Muscular Dystrophy

Jason Chan

Background: Duchenne muscular dystrophy (DMD) is a muscle wasting disease caused by deficiency of the protein dystrophin. The recently developed DMDmdx rat model has skeletal and cardiac muscle defects that closely mimic the initiation and progression of the disease in patients, making this model amenable to test for the effectiveness of exercise therapy. Presently, limited functional data is available for this novel model.
Purpose: To characterize physical function, gait, and exercise responses in the novel DMDmdx rat model.
Subjects: 37 bred and genotyped male Sprague-Dawley rats (age 15 wks) were included, with n=17 deficient in the dystrophin protein (DMD) and n=20 wildtype littermates (WT).
Methods: Assessments included maximal exercise testing on a motorized rodent treadmill, forelimb volitional grip strength, volitional running on a computer-monitored cage wheel, cage activity monitoring, and computerized gait analysis. Rats were acclimated to equipment prior to data collection. Unpaired T-tests examined differences between groups.
Results: DMD rats achieved a lower peak workload and work rate on the treadmill and ran less average nightly distance on the wheel than WT counterparts. Gait analysis revealed that DMD had lower front paw (FP) swing time, hind paw (HP) swing speed, FP stride length, and HP stride length; and a higher FP duty cycle. Cage activity daily distance and movement velocity, and volitional grip strength did not differ between DMD and WT.
Conclusion: Functional limitations and gait differences in the DMD rat reflect what is observed for patients with DMD, supporting suitability of this novel model for translational pre-clinical investigations.

Key words: Duchenne Muscular Dystrophy, Functional Testing, Gait analysis, rodent exercise, DMDmdx

References

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Transcutaneous Spinal Stimulation Improves Exoskeleton Assisted Walking in Spinal Cord Injury: A Pilot Study

Haley Coen

Spinal cord injury (SCI) often leads to severe paresis, limiting mobility and impairing walking ability. Two rehabilitation technologies aimed at restoring mobility in this population include robotic exoskeletons and transcutaneous spinal cord stimulation (tSCS). Combining these interventions has shown early promise in improving lower extremity function for people with SCI. This study seeks to further assess how use of this combined approach can improve gait function in people with motor incomplete SCI. Additionally, the study sought to expand upon previous surface electromyography (sEMG) investigations by analyzing changes in co-contraction in addition to overall sEMG activity. Four individuals with chronic motor incomplete SCI participated in the study. All participants performed exoskeleton assisted walking (EAW) and received tSCS at the T11 and L1 vertebrae. Outcome measures were collected twice per session, with and without tSCS, with the order of stimulation counterbalanced across sessions. P1 and P4 reduced the amount of external assistance required for stepping during EAW in the presence of tSCS. P2 and P3 exhibited improved gait speed in the fast 10 Meter Walk Test (10MWT) and distance in the 2 Minute Walk Test (2MWT) with the combination of tSCS + EAW. sEMG analysis demonstrated increased muscle activity and improved muscle coordination during gait when receiving tSCS. Our findings suggest the addition of tSCS leads to improved lower extremity coordination throughout the gait cycle and highlights the potential for the combined use of EAW + tSCS as a rehabilitative treatment strategy in individuals with incomplete SCI to improve functional gait outcomes.

Index Terms- electromyography, exoskeleton, rehabilitation, spinal cord injury, transcutaneous spinal cord stimulation

References

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Physical Activity in Obese Individuals with Type 1 Diabetes

Michael Fairchild

Abstract

Obesity has been an issue for those with type 2 diabetes, however is a growing concern in type 1 diabetes (T1D).[1,2] Environmental factors, increased carbohydrate consumption and intensive insulin therapy are contributing factors.[3] Physical activity (PA) is an integral part of combating obesity, but decreased participation and disease-specific barriers impact T1D.[4,5]

PURPOSE: The purpose of this study was to explore the relationship between PA and barriers to PA, health measures, and diabetes specific measures in a unique group of obese T1D.

METHODS: participants completed the International Physical Activity Questionnaire-Long Form (IPAQ-LF) and Barriers to Physical Activity in Type 1 Diabetes (BAPAD1). PA and health measures: moderate-vigorous PA (MVPA), sedentary time, body mass index (BMI), systolic blood pressure (SBP) and waist circumference. Diabetes specific measures: total daily dose of insulin (TDD), hemoglobin A1C (HbA1C)%, and continuous glucose monitor (CGM) metrics. Pearson correlations examined the relationships between these variables.

RESULTS: (mean(SD)): n=37(16 females), age 48(14)yrs, time with T1D 30(11)yrs, SBP 123.4(11.8)mmHg, BMI 32.8(2.7) and waist circumference 108.0(8.7)cm. Diabetes measures: HbA1C 7.1(0.7)%, time in range (TIR) 66(12)%, time above range (TAR) 32(13)%, time below range (TBR) 2(1)%, and TDD 61.0(23.7)units/mL. Thirty-nine percent of participants reported less than 150 minutes of MVPA per week. Risk of hypoglycemia was the leading diabetes-related barrier to exercise. Significant correlations were observed for SBP and TDD ($r=0.46, p=0.005$), waist circumference and TDD ($r=0.66, p<0.001$), MVPA and TBR ($r=0.46, p=0.01$), and sedentary time and TAR ($r=0.43, p=0.04$). **CONCLUSION:** This unique group of obese T1D demonstrated good A1C through increased insulin delivery, however this correlated with obesity metrics. Individuals meeting MVPA guidelines showed greater risk of hypoglycemia, suggesting the need for guidance of insulin management during exercise. Exercise specialists must understand the changing phenotype in T1D as well as the barriers and risks of exercise.

References

1. Corbin KD, Driscoll KA, Pratley RE, et al. Obesity in Type 1 Diabetes: Pathophysiology, Clinical Impact, and Mechanisms. *Endocr Rev*. 2018;39(5):629-663. doi:10.1210/er.2017-00191

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George Gay

Background and Purpose: There is limited research identifying patterns of and implications from delayed health services in older adults affected by pain. This study aims to describe the association of bothersome pain or activity-limiting pain with delays in health care services among community-dwelling older adults during the early COVID-19 pandemic.
Methods: Cross-sectional study using the COVID supplement to Round 10 of the National Health and Aging Trends Study (NHATS). Self-reported measures regarding demographics, the presence of bothersome or activity-limiting pain in the past month, any delay in needed or planned health care services, and delay in specific types of health care services were analyzed. We used descriptive statistics to characterize the sample and outcomes and compared delayed health care use by pain status using adjusted logistic regression that applied Round 10 survey weights.
Results: Of 3257 sampled responses, 54.7% reported having bothersome pain and 28.7% reported activity-limiting pain. Older adults with bothersome pain had increased odds of delaying physical therapy (Odds Ratio [OR]=2.22, 95% CI: 1.21 to 4.08) and specialist visits (OR=1.34, 95% CI: 1.01 to 1.78). Those reporting activity-limiting pain had increased odds of delaying physical therapy (OR=2.07, 95% CI: 1.00 to 4.26) and specialist visits (OR=1.54, 95% CI: 1.16 to 2.05).
Conclusion: Older adults with pain had increased odds of delaying physical therapy and specialty visits during the early COVID-19 pandemic. However, these delays were uncommon, so prevelance may be modest. Longitudinal investigation of these trends will be useful to understand the impact of early health service disruptions.

References

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Qualitative Analysis of Caregiver Perspectives Comparing the Permobil® Explorer Mini and a Modified Ride-On Car

Madeline Herrenkohl

Background: Children with cerebral palsy (CP) often have difficulty accessing devices that facilitate meaningful interactions with their environment. Powered mobility intervention may bridge the gap to improve self-initiated mobility and exploration at critical developmental stages.
Purpose: The purpose of this project was to evaluate parents' perceptions of their children's use of two pediatric powered mobility devices: a modified ride-on-car and the Permobil® Explorer Mini.
Number of Subjects: 24 caregivers of children 12-36 months old with CP GMFCS Levels II-V.
Materials and Methods: This multi-site, randomized, crossover clinical trial consisted of a 16-week intervention period with each device trialed for 8 weeks. Semi-structured interviews were conducted, audio recorded, and transcribed verbatim. Interviews were coded inductively and analyzed until data saturation occurred. Codes were compared and determined by four members of the research team until themes emerged.
Results: Five themes emerged from the data: *'One Size Doesn't Fit All'*, *'Device as a Mobile Learning Environment'*, *'Environmental Affordances'*, *'Evolving Expectations'*, and *'Participation/Socialization'*. **Conclusions:** Families reported benefits and drawbacks for each device, with an emphasis on the modifications they had to make to the devices to fit their child's specific needs. Despite modifications, parents reported overall increased engagement with others and the environment. **Clinical Relevance:** Results demonstrate the value of powered mobility for children and their families, while at the same time encouraging therapists to think about the fit of powered mobility into a family's life, the appropriate device to choose, and the importance of emphasizing the individual needs of each child.
Keywords: early powered mobility, cerebral palsy, caregiver perceptions, modified ride on cars, Explorer Mini

References:

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Up and Down: Effects of Partial Bodyweight Support on Social and Environmental Interaction in Infants With Down Syndrome

Lindsey Jouett

Background: Children with Down Syndrome (DS) experience developmental delays across multiple domains. Benefits of interventions focusing on motor skill acquisition have been previously reported – partial bodyweight support treadmill training accelerates onset of walking, but limits non-linear exploration. Overground partial bodyweight harnesses (OPBWH) may offer access to more enriching play, mobility, and environmental exploration.
Purpose: Examine trends in child social interaction, environmental engagement, and mobility during OPBWH intervention for pre-walking children with DS.
Participants: 6 children under age 3 with DS.
Methods: Prospective, randomized cross-over case series – three, 30-minute play sessions per week in an enriched play environment within a 9'x9' OPBWH system for 3 weeks per 2 intervention conditions: with and without harness engaged (offsetting ~20% bodyweight). Behavioral video coding conducted by 3 coders for every 6 seconds of footage. Frequency counts for time spent in each behavior were compared between initial and final play sessions per condition.
Results: End of study compared to baseline, children demonstrated a 32.01% average increase in social interaction, a 13.50% average increase in environmental interaction; a 4.45% average increase in time spent in dynamic standing with OPBWH engaged verses a decrease of 2.54% in the non-harness condition; a 9.67% average increase in cruising behavior.
Conclusion: Results show OPBWH intervention led to significant improvement in overall social engagement, environmental interaction, and mobility, while providing non-linear exploration in an enriched play environment.
Clinical relevance: OPBWH is a feasible and potentially valuable early intervention for pre-walking children with DS, impacting motor development, social engagement and environmental interaction.

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Caregiver's perception of young children's need for and capabilities using powered mobility

Kiana Keithley

Background/Purpose: For children with disabilities, self-initiated mobility is often augmented through powered mobility (PM), but access is often limited for young children. Caregiver's perceptions, stigma and/or bias towards PM has shown to be a limiting factor. As new PM options are emerging, it's important to consider how caregivers perceive these devices and their child's capabilities during and after use. The purpose of this study was to understand caregiver perceptions of PM intervention using a novel PM device.
Participants: 10 caregivers of children with developmental disabilities.
Methods: This qualitative study was part of an overarching mixed methods study where children participated in 12 driving sessions using the Permobil Explorer Mini. Each visit included two 15–20-minute sessions where the child was free to drive and interact with toys, caregivers and the research team. Exit interviews were conducted with caregivers at a post-assessment visit, transcribed verbatim, coded inductively, and analyzed by two researchers until themes emerged.
Results: Five themes emerged from the data: (1) *Clear need, benefit, and design drawbacks*; (2) J*oy in Mobility, Emerging Autonomy'*; (3) *New skills in and out of the Device*; (4) *'Changing views of capability and adaptability';* and *(5) Lingering Stigma and Uncertainty.*
Conclusions/Discussion: Caregivers viewed PM as a fun and beneficial experience that shifted their perceptions of PM and their child's capabilities. They indicated a desire for more access so their child could continue to gain independence and developmental skills. These beliefs remained juxtaposed with lingering stigma for some caregivers, and a stated desire for more modifiable PM options.
Clinical Relevance: Amplifying the voices of caregivers helps improve intervention processes and design of PM devices to support participation and self-initiated mobility of young children with disabilities. PM may also be a valuable intervention to facilitate shifting caregiver perceptions of their child's capabilities, reduction of stigma, and improved access throughout the lifespan.

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The Prevalence of Stress Urinary Incontinence is Higher in Women with the Chronic Interstitial Lung Disease Lymphangioleiomyomatosis (LAM) Compared to the General Population

Brenna Lanton

Introduction: Urinary incontinence (UI) negatively impacts the quality of life (QoL) of an estimated 53% of women.[1] The most prevalent subtype is stress UI (SUI) (26%), defined as involuntary leakage of urine with activities that increase intra-abdominal pressure (e.g. jumping, coughing).[1,2] Chronic lung disease (CLD) is a risk factor for SUI and previous research has focused primarily on obstructive lung disorders.[3–6] SUI has not been examined in Lymphangioleiomyomatosis (LAM)-- a rare, progressive interstitial lung disease.[7] The purpose of the study is to characterize the incidence and impact of SUI in LAM as compared to healthy matched controls and other CLDs.[8]

Methods: This cross-sectional prevalence study surveyed 385 women, including 167 with LAM and 218 healthy controls, matching for major SUI risk factors including age, BMI and parity. Participants completed a detailed questionnaire assessing urinary and respiratory symptoms, and overall health status.

Results: The prevalence of SUI was significantly higher in the LAM group (72%) compared to the healthy matched controls (48%). SUI in LAM was not correlated with cough frequency or lung function but was associated with other respiratory symptoms including dyspnea and phlegm. Less than a third of those with SUI reported symptoms to their primary care provider, and prescribed treatments often diverged from conservative care recommendations.

Conclusions: SUI prevalence in LAM is significantly higher than in healthy, matched controls and is similar to other CLDs. Further research is needed to improve SUI screening and management in LAM.

Effects of Powered Mobility Intervention on Development and Learning Outcomes in Young Children with Disabilities

Audrey Lynn

Background/purpose: For children with developmental disabilities who cannot mobilize independently or efficiently, powered mobility can provide a key means of self-initiated mobility and participation while having positive impacts on developmental domains. Benefits of powered mobility in young children 1-3 years is underexplored and, furthermore, little research exists describing how children interact with and learn to use a powered mobility device (PMD) over time. The purpose of this study was twofold: 1) To examine changes in global development in children following EPM intervention; 2) To understand the learning processes at various stages during PM intervention.
Participants: 10 children with cerebral palsy (GMFCS IV-V) and other developmental disabilities
Methods: The prospective, quantitative cohort study comprised of 12 visits consisting of two 15–20 minute driving sessions per visit using the Permobil Explorer Mini. Developmental domains were assessed using the Bayley Scales of Infant Development 4th ed. (BSID-IV) pre- and post-intervention and analyzed via paired T-tests. PM learner phases were assessed at the initial, mid, and end of the study using the Assessment of Learning Powered Mobility (ALP). ALP facilitating strategies were used by parents and the research team to provide PM facilitation based on each child's learning phase.
Results: Across all participants, significant mean increases were observed in cognition (p=0.0152), receptive language (p=0.0019), fine motor (p=0.0058), social-emotional (p=0.0429), and personal language (p=0.0094). Each child improved at least one ALP phase, with half the children reaching goal-directed driving proficiency.
Conclusion/Discussion: EPM intervention for young children with disabilities yields a significant, positive shift in crucial developmental domains without impeding gross motor progress. Children in any learning stage can benefit from EPM intervention and show progression of learning to drive over time.
Clinical relevance: Clinicians should consider PM training and targeted intervention strategies as a potentially effective intervention for children ≤ 3 years, regardless of long-term mobility needs/expectations.

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Pulse Oximetry Self Monitoring During Exercise Enhances Perceived Safety, Autonomy and Usability in Idiopathic Pulmonary Fibrosis

Marion Paetznick

Purpose: This study examined the use of medical-grade pulse oximetry for remotely monitoring home exercise and its impact on the perceived safety and usability of a digital health platform for adults with IPF stable on antifibrotic therapy.

Methods: In-depth, semi-structured interviews were conducted with adults with IPF stable on antifibrotic therapy between Oct 2022 and March 2023 after 16 weeks of interaction with a technology platform that included an activity monitor (Fitbit Charge 5) and a medical-grade fingertip pulse oximeter (Nonin BLE 3230) as part of a 12-week home exercise intervention (NCT04838275). Interviews were held virtually, recorded, transcribed verbatim, and analyzed using qualitative software. Responses related to device usability were categorized using the MOLD-US framework, with additional codes created for perceived safety.

Results: Seventeen adults with IPF [7 female, mean age 67.4±9 (SD)] participated. Ninety-four percent perceived medical-grade pulse oximetry as an exercise facilitator, reporting increased confidence in exercise safety and empowerment in decision-making about exercise intensity and oxygen use. Participants preferred the pulse oximeter device display during exercise, as its direct accessibility mitigates technological barriers. Challenges included difficulties syncing data, interpreting data, and physical discomfort.

Conclusions: Medical-grade fingertip pulse oximetry enhances perceived safety and confidence in home exercise for patients with IPF. While users benefit from real-time data, they face several barriers to technology. Recommendations include targeted education for setup, confirmation of data delivery, customizable app interfaces for older adults, cost-benefit analyses for medical-grade devices, and improved device ergonomics designed for physical activity.

An mHealth Exercise Intervention Increases Physical Activity and Quality of Life in Idiopathic Pulmonary Fibrosis

Eliseo Veras-Tobos

Purpose: Idiopathic pulmonary fibrosis (IPF) is a progressive interstitial lung disease which negatively impacts exercise tolerance and health-related quality of life (HRQL). Here we characterize the effect of a mobile health (mHealth) exercise program on physical activity, program adherence and HRQL of individuals with IPF stable on antifibrotics.
Subjects: 29 adults with IPF (ages 46-79 years) stable on antifibrotics and enrolled in an RCT.
Methods: Subjects were randomized to a 12-wk mHealth intervention including aerobic and resistive exercise (Arm 1), or monitoring only (Arm 2). Wearable heart rate monitors captured PA metrics. For Arm 1, ratings for Effort and Dyspnea were obtained for all intervention workouts, and weekly adherence was obtained. Pre- and post- HRQL assessments were obtained.
Results: Adherence to the mHealth intervention was 91±11% for the aerobic and 96±7% for the resistance exercises. Arm 1 had greater daily average minutes of moderate-to-vigorous physical activity (MVPA), and intense PA during the intervention period. When examined relative to the run-in period, MVPA increased by 21% for Arm 1, but decreased by 35% for Arm 2. HRQL scores for Arm 2 significantly increased (worsened) by week 20 compared to baseline. Arm 1 subjects with greater MVPA during their intervention had improved final HRQL scores. Those individuals were able to exercise at higher METS.
Conclusion: An mHealth exercise intervention is well-tolerated and increases MVPA for patients with IPF stable on antifibrotics. Performing PA at moderate or greater intensity can improve HRQL.
Key Words: idiopathic pulmonary fibrosis, physical activity, mHealth, exercise

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Physical Therapy Management of Lance Adam's Syndrome following Cardiac Arrest: A Case Study

Anjella Ysabel Alejo

Background: Lance Adam's syndrome (LAS) is a rare complication following cardiorespiratory arrest and successful resuscitation, characterized by involuntary muscle jerking.

Purpose: To describe the hospital rehabilitation course for a person with LAS, including management of the characteristic involuntary muscle jerking.

Case Description: The patient was a 51-year-old female who presented following PEA arrest secondary to opioid overdose. She was later diagnosed with LAS and had myoclonic jerks that caused interruptions in muscle activation with increased load on the nervous system, such as during intentional movement, times of heightened stress or fear, and with increased postural demand. In conjunction with global deconditioning from a prolonged stay in the intensive care unit, the patient's mobility was severely limited. Personal factors such as a history of substance abuse, HIV, and family structure prolonged discharge from the hospital.

Outcomes: The patient made significant improvements in bed mobility, transfers to edge of bed, and sitting posture but made more gradual progress with standing and ambulation due to the severity of her myoclonic jerking. Unfortunately, this patient's final outcome was unknown since they were discharged to an adult family home and were lost to follow up.

Discussion and Conclusion: The role of physical therapy in managing patients with LAS is not well researched, however pharmaceutical management alone is not enough to restore a patient's ability to independently mobilize. Physical therapy plays a unique role in facilitating return to meaningful function for patients with this significant neurological impairment.

Key Words: Lance Adam's syndrome, Myoclonic Jerks, Physical Therapy, Acute Care

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Nurturing Bonds and Balancing Risk
A Case Report in the Therapeutic Alliance and the Management of Fall Risk in an Older Adult

Grace Barker

Background and Purpose: Falls are the leading cause of non-fatal and fatal injuries among adults over 65 years. Physical therapists have a unique role in working with older adults to prevent falls, decrease fall risk, and rehabilitate an individual after a fall. The literature describes the therapeutic alliance as the relationship between healthcare providers and their patients. It is a positive mediator and predictor for patient outcomes. The purpose of this case report is to discuss the importance of the therapeutic alliance during the physical therapy management of balance deficits and fall risk in an older adult with a history of falls; using aquatic therapy.
Setting: Treatment was provided in an outpatient clinic specializing in the care of patients with neurologic conditions.
Case Description: J is an 81-year-old female (she/her) patient who was referred by her primary care physician for aquatic physical therapy treatment. She had complaints of decreased balance and lower extremity strength, and difficulty with independent activities of daily living (IADLs) following two falls in the past year.
Outcomes: J subjectively reported increased confidence in functional mobility and demonstrated improvements in all outcome measures when re-assessed, however, scores indicated continued fall risk.
Discussion and Conclusion: This case study demonstrates the importance of developing a strong therapeutic alliance when the treatment timeframe is short and it contributes to the understanding of aquatic therapy's efficacy in this context, where large-scale studies are limited.

Key Words: Falls, Therapeutic Alliance, Older Adult, Aquatic Therapy, Balance Deficits

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A Case Study of Treating Functional Neurologic Disorder with Intensive and Interdisciplinary Rehabilitation Therapies

Maia Chin

Background and Purpose: Functional neurologic disorder (FND) is a group of common neurologic movement disorders characterized by weakness, abnormal movements, or nonepileptic seizures. Although FND can mimic a variety of other movement disorders, like seizures, tremor, or parkinsonism, it often presents without any apparent anatomic abnormalities. FND is a multifactorial disorder with highly variable presentations that responds well to coordinated interdisciplinary care. The purpose of this case report is to summarize a case of FND that presented to a hospital and demonstrated great improvements in independent functional mobility with intensive physical therapy (PT) and occupational therapy (OT) sessions.

Case Description: The patient is a 41-year-old female who presented to the emergency department with altered mental status, catatonic state, left sided stiffness, right sided flaccidity, and suspected FND. The patient's past medical history was significant for anxiety, stroke, and recent possible suicide attempts. Interventions followed the Brigham and Women's Hospital Department of Rehabilitation Services Standard of Care for Functional Neurologic Disorder guidelines and included intensive PT and OT.

Outcomes: After a 9-day inpatient rehabilitation facility (IRF) stay, the patient was discharged to her parent's home. The patient met all her functional mobility goals, including independent bed mobility, ambulation on a smooth surface, and stair navigation.

Discussion and Conclusion: Throughout her stay in an IRF, the patient made significant gains in all aspects of her functional mobility with family support and interdisciplinary teamwork from the rehabilitation team. This case report demonstrates the real-world application of the methods describes in the research.

Key Words: functional neurologic disorder, neurologic physical therapy, interdisciplinary teamwork

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Complex Hip Pain with Functional Femoroacetabular Hip Impingement and Pelvic Floor Hypertonicity Considerations

Eugenia Chui

This case study documents the assessment, intervention, and outcomes of a comprehensive physical therapy approach addressing a 22-year-old female patient experiencing deep, chronic hip pain. It is hypothesized that functional femoroacetabular impingement caused by muscle guarding secondary to pelvic floor dysfunction radiating out into the right hip and periurethral muscles contributed to her symptoms. Physical therapy plan of care incorporated a combination of therapeutic exercise, neuromuscular re-education, and manual therapy for both the hip joint and pelvic floor musculature. Intervention also included patient education with expectations for prognosis and chronic pain management. After a 12-week period, the patient showed statistically insignificant improvement in the Lower Extremity Functional Scale, however, reported subjective improvement in condition and progress on her long-term goals. This report study explores the complex and interconnected relationships between hip pain and pelvic floor dysfunction and encourages physical therapists to consider the pelvic floor's involvement in patients with hip pain.

Key words: hip pain, chronic pain, femoroacetabular impingement, movement impairment syndrome, pelvic floor dysfunction, pelvic floor hypertonicity, case report

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Inpatient rehabilitation physical therapy effects of high intensity gait training on contraversive pusher syndrome: A case report.

Zachary Church

Background and Purpose: Contraversive pusher syndrome is a rare symptom of cerebrovascular accidents where an individual will have a misalignment of their perception of vertical towards their hemiparetic side leading to significantly increased risk of falls.12 The purpose of this case study was to look at the impact of High-Intensity Gait Training (HIGT) to improve functional outcome scores for individuals with contraversive pusher syndrome after a cerebellar peduncle infarction.15
Setting: Treatment was provided at a rural inpatient rehabilitation hospital.
Case Description: The patient was a 59-year-old white male, evaluated 13 days post-stroke with left (L) sided hemiparesis and moderate contraversive pushing. Additional key impairments included dysarthria, dysphagia, and hypoesthesia. In addition to high intensity gait training interventions included balance, cross-body reaching, and functional movement training.
Outcomes: The patient showed rapid return of function and regained modified independence with ambulation during admission. Patient scores on Medicare-based functional outcome measures improved and interventions were transitioned to outpatient physical therapy after discharge.
Discussion and Conclusion: Many factors influenced the positive outcomes seen by this patient. The incorporation of HIGT was an impactful tool for shortening the recovery time for this patient with contraversive pusher syndrome. This case emphasizes the need for more research about the benefits of HIGT with this population.
Key Words: contraversive pusher syndrome, inpatient rehabilitation, high-intensity gait training.

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Physical Therapy Evaluation and Treatment of a Patient with Vertebral Artery Dissection and Chronic Cervicogenic Somatic Tinnitus after a Motor Vehicle Accident: A Case Report

Sergey Datskiy

Background and Purpose: Cervicogenic somatic tinnitus (CST) is a subset of tinnitus which has many possible etiologies, one of which is mechanical disruption after traumatic motor vehicle accident. Diagnosing and managing CST is a challenging task; Clinicians must rule out sinister pathologies such as vertebral artery signs, cranial nerve involvement, fractures, and possible spinal cord compression to identify whether the patient is appropriate for physical therapy care. This case study explores CST's clinical nuances and the application of a multifaceted physical therapy regimen using the International Classification of Functioning, Disability, and Health model.
Case Description: A 57-year-old male, 14 months post-MVA, sought treatment for persistent ringing in his left ear. Key issues included tinnitus severity, reduced cervical mobility, muscle weakness, and proprioceptive deficits. Treatment involved cognitive behavioral therapy, joint mobilizations, education, posture correction, and strengthening exercises.
Outcomes: After 24 visits, the patient exhibited reduced tinnitus intensity, enhanced joint proprioception, improved muscle endurance, and better overall functioning according to the Tinnitus Handicap Inventory.
Discussion and Conclusion: This case report outlines the successful physical therapy management of a patient with a complex presentation of CST in addition to several psychosocial factors. However, future research should focus on improving CST diagnostic criteria and PT management guidelines for patients with CST.

Key Words: cervicogenic somatic tinnitus, motor vehicle accident, vertebral artery dissection, CST, subjective tinnitus

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Skilled nursing facility physical therapy treatment following lumbar decompression & fusion for radiculopathy secondary to lumbar stenosis and spondylolisthesis: A case report.

Raphael Enrico

Background/Purpose: Lumbar surgery, combining interbody fusion with decompressive techniques, stands as a vital intervention for individuals suffering from conditions like spondylolisthesis, degenerative disc disease, and spinal stenosis, offering pain relief. This case study explores the impact of physical therapy on a 75-year-old male patient following lumbar fusion and decompression surgery. **Setting:** Treatment was provided at a skilled nursing facility with various healthcare and rehabilitation personnel assisting the patient with his recovery.
Case Description: A 75-year-old male with a history of bilateral low back pain underwent posterior decompression and fusion surgery for degenerative kyphoscoliosis. Post-surgery, he presented with impairments in balance, lower extremity strength, and endurance, limiting his ability to perform daily activities. With skilled physical therapy intervention, he aimed to regain independence at home and in the community.
Outcomes: Significant improvements in independence were assessed with bed mobility, transfers, and ambulation, progressing from requiring maximum assistance at the time of evaluation to achieving stand-by assist and moderate independence.
Discussion and Conclusion: Patient's care plan included the use of a tilt-in-space wheelchair, Jewett brace necessary to maintain post-surgical lumbar precautions, and rigorous physical therapy focusing on strengthening lower extremity musculature necessary for bed mobility, transfers, and ambulation. Upon discharge, he returned to his single-level apartment with continued support from home health physical therapy, caregiver services, and his daughters.
Key Words: Physical therapy, Skilled nursing facility, Spinal Stenosis, Spondylolisthesis, Posterior lumbar decompression

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Outpatient Physical Therapy Management for a Child with Hirschsprung's Disease: A Case Report

Bing Gao

Background and Purpose: Infants with severe medical complexity at birth often require prolonged neonatal intensive care unit (NICU) stay. The NICU environment exposes infants to significant stressors which often leads to early childhood developmental delays. Early Intervention physical therapy is effective in providing stimulation and experience from multiple aspects to improve development in motor functions. This case study demonstrates the early intervention physical therapy management of a young child with complex medical history in an outpatient pediatric clinic setting. **Case Description**: The child was a 16-month-old male with gross motor developmental delay secondary to complex medical diagnosis, including Hirschsprung's disease, and multiple prolonged NICU stays. He presented with low tolerance to prone positioning due to placement of multiple lines and tubes, and inability to crawl and walk. Physical therapy treatment focused on promoting development of age-appropriate gross motor skills and caregiver education.

Outcomes: After 8 weeks of weekly treatment, the child demonstrated improved tolerance and postural control in prone and quadruped. He was able to cruise independently while holding the furniture. Though there were improvements on gross motor raw scores, no clinical nor statistically significant differences were found in either the scaled scores or the growth Scales Value (GSV). This result may be due to the limited intervention sessions and the nature of the design of the BSID-4 gross motor.

Discussion and Conclusion: The lack of statistically significant change in BSID-4 may indicate the need for a more intensive or longer intervention period for young children with complicated medical concerns. Future clinical case reports and research are needed to explore the ideal model of early intervention physical therapy in children with complex neurological diagnoses and prolonged hospitalization.

Key Words: Hirschsprung's Disease, prolonged hospitalization, early intervention, developmental delay, pediatric physical therapy

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Physical Therapy Management Status Post Reverse Total Shoulder Arthroplasty: A Case Report

Emily Geranen

Background and Purpose: The purpose of this case report is to discuss the physical therapy considerations, and rehabilitation outcomes status post a reverse total shoulder arthroplasty (RSA) presenting to outpatient physical therapy for postoperative management. This paper will examine the effectiveness of a postoperative protocol, including mobilization and strengthening at four weeks after RSA.

Case Description: The patient is a 53-year-old male status post RSA who demonstrated high motivation to return to a prior level of function as soon as possible in the context of several comorbidities and high stress. He has a history of kidney cancer, rheumatoid arthritis, history of pre-diabetes, recent Valley Fever infection, and environmental stressors. He works as a CEO for a healthcare company and started a job at a new company two weeks post-surgery. The patient lived with his supportive family and lived a healthy lifestyle, exercising 3-4 times per week. Key impairments include limited shoulder range of motion and strength, limiting his participation in responsibilities at home and work, maintenance of his physical health, and ability to play golf for leisure.

Outcomes: Interventions included a combination of isolated and functional strengthening of the rotator cuff, periscapular muscles, and surrounding shoulder musculature. He met all his goals and fully recovered his functional abilities.

Discussion and Conclusions: This paper demonstrates the efficacy of providing evidence-based practice and patient-centered care in the context of early mobilization post-surgery in a case involving various comorbidities, environmental stressors, surgical complexity, and potential facilitators and barriers.

Keywords: Reverse-total shoulder arthroplasty, physical therapy, strengthening, evidence-based practice.

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Persistent Post Concussion Syndrome Following Concussion in a Male Adult

Michael Hall

Background and Purpose: Persistent Post Concussion Syndrome (PPCS) is a complication following concussion that varies greatly in presentation within clinical profiles dividing causes into specific systems. The purpose of this paper is to demonstrate that effective treatment of PPCS requires a strong therapeutic alliance, which is complicated by the variability and complexity of the presentation of PPCS.
Case Description: The patient was a 56-year-old male presenting to outpatient physical therapy 1 month following a motor vehicle accident (MVA) in which he was diagnosed with a mild traumatic brain injury. He presented with left hip and lumbar pain, mid cervical hypomobility, decreased cervical range of motion and several neurological symptoms included in the PPCS definition including mental fog, difficulty concentrating, vertigo and migraines. Physical therapy treatment primarily addressed his dizziness and his cervical, lumbar and hip impairments, attempting to reduce musculoskeletal components of his symptoms.
Outcomes: Patient A reported some reduction in symptoms. However, following infrequent treatments and improper development of the therapeutic alliance, Patient A ceased attending physical therapy prior to reassessment. The patient also stopped responding to Physical Therapist communications.
Discussion and Conclusion: The therapeutic alliance is crucial in treating patients suffering from PPCS. This alliance can be negatively impacted by an insufficient amount of time dedicated to patient treatment, failure to align therapy and patient goals, and the patient's perceived lack of empathy from the Therapist.
Key Words: persistent post concussion syndrome, mild traumatic brain injury, cervicogenic headache, post-traumatic headache, post-traumatic vertigo, therapeutic alliance

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Physical Therapy Management following Anterior Cruciate Ligament Reconstruction with Internal Bracing and Quad Tendon Autograft: A Case Report.

Briana Heng

Background and Purpose: The incidence of Anterior Cruciate Ligament (ACL) injuries and subsequent reconstruction surgeries is on the rise, demanding extensive rehabilitation to address potential long-term consequences like knee pain, muscle weakness, instability, limited range of motion, altered biomechanics, psychological effects, and decreased levels of physical activity. This case report details the physical therapy management and considerations for establishing care of a complex case, status post ACL reconstruction with internal bracing and quadriceps tendon autograft, and Iliotibial band tendonitis and its impact on physical function of an adolescent male.
Case Description: A 13-year-old male presented one-week postoperatively to an outpatient physical therapy clinic following ACL reconstruction with internal bracing and quadriceps tendon autograft of his left knee. The patient presented with expected post-surgical impairments in reduced range of motion, strength, weight bearing, pain, and reduced activity tolerance. Physical therapy focused on improving knee range of motion, lower extremity strength, proprioception, pain, edema, gait, and balance.
Outcomes: Following nine weeks of rehabilitation, the patient demonstrated improvements in overall quality of gait, knee range of motion, strength, pain, activity tolerance, and self-reported lower extremity function. Symmetrical knee range of motion, symmetrical movement mechanics, and pain continued to show deficits.
Discussion and Conclusion: This case report highlights the importance of effective physical therapy interventions for patients who have undergone anterior cruciate reconstruction and physical therapy management of the post-operative case.

Key Words: Anterior Cruciate Ligament Reconstruction, Knee surgery, Physical Therapy.

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Effects of Sport-Specific and Delayed Initiation of Rehabilitation on a High-Level Rugby Athlete Following Medial Patellofemoral Ligament Reconstruction: A Case Study

Angelo Hynds

Background and Purpose: The purpose of this case study is to evaluate and discuss the importance of timely and specific rehabilitation for a male rugby player working towards return to high level competition after medial patellofemoral ligament (MPFL) reconstruction surgery. Additionally, it will present factors related to the rehabilitation of athletes for return to competition including following a timely approach to rehab and a program tailored to that athlete's specific deficits.

Case Description: The patient is a 26-year-old male competitive rugby player, referred to physical therapy following MPFL reconstruction 8.5 weeks prior. Before surgery, the patient had over a decade of recurrent lateral patellar dislocations that occurred through contact and non-contact mechanisms. After delaying rehab, he presented with left sided weakness and pain postoperatively. In rugby, there are various loads placed on the knee due to sport-specific tasks, which can increase risk of injury if the player is not able to withstand these forces.

Outcomes: Patient underwent an intensive rehab program that consisted of ten successive and interrelated phases. During this time, an extensive home exercise program was created, including resistance training, to address his underlying impairments, followed by sport specific and plyometric activities introduced to prepare for return to competition.

Discussion and Conclusion: This paper evaluates the implications of delaying physical therapy while examining the benefits of sport-specific rehab programs. Postoperative cases are vastly considered mild to low complexity, which discredits the importance of addressing underlying impairments and following through on a rehab program for return to competition.

Key Words: Return to play, Sport specific rehab, Knee, Delayed rehab, Physical Therapy

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Physical Therapy Management of a 23-year-old Female with Second Revision of ACL Reconstruction: A Case Report

Kelsey Jaap

Background: Anterior cruciate ligament (ACL) injuries account for almost half of all knee injuries. Modifiable and non-modifiable risk factors include younger age, higher body mass index, smaller femoral notch, smaller ACL, hypermobility, joint laxity, previous ACL injury and female sex. While clinical practice guidelines exist for primary prevention of ACL injuries, there has been little research into rehabilitation to prevent re-injury after return-to-sport.
The purpose of this case report is to highlight the importance of understanding risk factors associated with re-injury after primary ACLR and the role that physical therapy plays in return-to-activity.
Case Description: The patient is a 23-year-old female who presents to an outpatient orthopedic physical therapy clinic one-week status-post right ACL reconstruction with quadriceps autograft, medial meniscus transplant and iliotibial band tenodesis. The patient also underwent two prior right knee surgeries for previous ACL injuries. She presents with impairments in right knee flexion and extension range of motion, gross right lower extremity strength, and quadriceps lag which are limiting her ability to perform ADLs.
Outcomes: The patient demonstrated improved knee flexion and extension ROM, global knee and hip strength, post operative pain, and LEFS scores. She continued to demonstrate quadriceps strength deficits.
Discussion & Conclusion: Existing protocols, such as the ACL-SPORTS training program, can provide distinct guidelines to help determine when a patient is ready to begin the next phase of rehabilitation and ultimately return-to-sport.

Key Words: Anterior cruciate ligament reconstruction (ACLR), osteochondral dissecans, return-to-sport, physical therapy

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A clinical analysis of blood flow restriction training for analgesia and its impact on force production in the post-anterior-cruciate ligament reconstruction athlete

Jacky Dean Jones

Background and Purpose: Blood flow restriction (BFR) therapy has recently become a more common modality for analgesia. However, its fatiguing effect on the client may lead to reductions in force output and performance in an athletic or rehabilitative context. This decrease in performance could potentially lead to technique deviations or reduce the efficacy of particular interventions following BFR.
Setting: Treatment was provided in an outpatient sports and orthopedics clinic in Seattle, Washington. **Case Description:** The patient was a 25-year-old male competitive judo athlete with a past medical history of an ACL allograft in 2016 and was seen for an ACL autograft of the same knee following the allograft failing. He had typical post-operative impairments, including gait deviations, weakness and atrophy of the affected leg, range of motion loss, and knee pain. Interventions provided included but were not limited to progressively increasing range of motion, strengthening the affected leg, neuromuscular reintegration, gait training, and using BFR.
Results: Following the use of BFR, there was a notable decrease in the force production of the affected extremity compared to prior to BFR. Additionally, there may have been a potentiation effect with the non-BFR intervention as the affected extremity showed an increase in force production. The index from unaffected to affected extremity before and after BFR was inconsistent and no clear distinctions could be drawn.
Discussion: The contrast of performance and analgesia needs to be assessed and weighed when clinicians are making decisions in the application and purpose of BFR.

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A Case Study Report Reviewing Physical Therapy Treatment of a Patient with Parkinson's Disease in Inpatient Rehabilitation

Roozbeh Katiraie

Background and Purpose: Parkinson's Disease (PD) is a common progressive neurological disease affecting older adults, yet individuals with PD are not frequently admitted into the inpatient rehabilitation setting. This occurs even less so in rural areas where PD patients experience less access to healthcare than in urban areas. This case study examines inpatient physical therapy interventions and outcomes of a patient with PD who lives in a rural area.
Case Description: The patient was a 72-year-old female previously diagnosed with PD with recent hospital admission due to complications related to her feeding tube. Physical therapy treatment included gait and balance training, bed mobility, and functional strength training.
Outcomes: With the introduction of PD-specific treatment interventions such as gait training with external visual cues and verbal cues to manage freezing of gait, the patient improved her functional mobility and increased her independence at discharge. She increased her ambulation distance and decreased the level of assistance required for transfers and bed mobility.
Discussion and Conclusions: Although the patient did not meet all her initial physical therapy goals, inpatient rehabilitation improved her quality of life and independence. This case study highlights the importance of appropriate inpatient rehabilitation admissions for PD patients and raises concerns regarding health care access to people with PD in rural areas.
Key Words: Parkinson's Disease, Physical Therapy, Inpatient Rehab

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Physical Therapy Management of Hepatopulmonary Syndrome in the Acute Care Setting

Erica Kendall

Background and Purpose: Hepatopulmonary syndrome is an uncommon complication of liver disease that interrupts the ventilation-perfusion process in the lungs and causes severe hypoxia. Due to the significant impact on activity tolerance, patients with this condition can experience further complications, mental health disorders, and decreased quality of life. The purpose of this case study was to evaluate the effect of a multifactorial treatment approach in a person with hepatopulmonary syndrome after receiving liver transplantation.
Setting: Treatment was provided in the intensive care and inpatient units at a private hospital.
Case Description: The patient was a 48-year-old female with chronic end stage liver disease/liver cirrhosis complicated by hepatic encephalopathy and hepatopulmonary syndrome. Past medical history was significant for history of seizures, alcohol abuse, depression, and cystitis. She presented with deficits in her functional mobility, strength, balance, and pulmonary function requiring large amounts of supplemental oxygen. Interventions included functional mobility training, strengthening, and progressive aerobic activity with monitoring of oxygen saturation levels.
Outcomes: The patient showed improvements in her functional mobility, aerobic capacity, activity tolerance, and JH-HLM and AM-PAC Mobility scores. She had improved mentation and independence with managing daily tasks and returning home after discharge.
Discussion and Conclusion: Due to the rarity of hepatopulmonary syndrome, the research surrounding management of this condition is limited. This case report brings awareness to this condition and discusses successful interventions for accomplishing discharge goals. However, further research is needed to support these interventions and determine the most optimal treatment approach for patients with this condition.
Key Words: hepatopulmonary syndrome, liver transplant, end-stage liver disease, physical therapy

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Hypophosphatemic Rickets in Young Adults: Surgical Intervention and Multidisciplinary Approach to Care: A case report.

Angela Laureta

Background: Rickets is a metabolic disorder commonly found in children. It can occur due to inadequate mineralization of the bone, resulting in skeletal deformities. Factors such as biological, environmental, and social determinants of health must be examined in every individual, as this can significantly impact their prognosis.
Purpose: This case highlights the importance of physical therapy as part of the multidisciplinary approach to treating rickets in children with challenges in accessing care. This approach aims to empower children to prevent worsening conditions and promote functional independence in mobility and activities of daily living.
Case Description: A16-year-old female from Guatemala presents with a history of Hypophosphatemic Rickets. Due to the lack of access to medical care, the patient developed a bilateral lower extremity deformity, affecting her physical function and mobility. She received consecutive bilateral lower extremity surgical intervention through the application of TL-HEX External Fixator as a treatment to correct her marked deformity. Physical therapy intervention focused on improving lower extremity range of motion and strength, increasing weight-bearing tolerance, and promoting gait training.
Outcomes The patient was highly motivated and adhered to her treatment plan, which allowed for a fast progression. Additionally, she received an interdisciplinary and patient-centered care approach that contributed to her positive progress.
Discussion: The patient will continue to receive outpatient physical therapy until she meets her orthopedic goal of adequate mineralized bone at the osteotomy site and a stabilized medical condition. Upon discharge, she will return to Guatemala, facing the challenge of continuity of care.

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Physical Therapy Management of Adult Female with Complex Lower Extremity Pathology and Fall Risk

Helen (Yuanyuan) Liu

Background: There is limited consensus for physical therapy management of chronic Greater Trochanteric Pain Syndrome (GTPS) after Total Hip Arthroplasty (THA). This paper discusses THA epidemiology, risk factors, and conservative management of GTB with physical therapy.
Case description: A 77-year-old female was referred to physical therapy for bilateral hip pain and impaired balance. She presented with gait deviations, decreased hip range of motion and strength, impaired muscle flexibility, and diminished sensation in the lower extremities. These impairments affect her ability to walk, stand, transfer, negotiate curbs and stairs, and increase her fall risk . Despite potential barriers including comorbidities such as venous insufficiency, cancer history, lumbar fusion, and prior bilateral THA, she demonstrated fair to good prognosis and rehab potential, with good social support, self-efficacy, Medicare coverage, and access to assistive devices.
Outcomes: Patient made significant improvement in 6-Minute Walk Test and increased three times Minimal Clinically Important Difference in 10-Meter Walk Test. However she did not make significant improvement in the Romberg Balance Test.
Discussion and conclusions: The main reason this case is successful at achieving most goals for physical therapy is the prioritization of impairments. This involves determining what physical therapy can and cannot improve functionally. Further research is needed to help determine the best treatment approach for patients with similar presentations.
Key words: total hip arthroplasty, greater trochanteric pain syndrome, chronic hip pain, fall risk, balance, comorbidities

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Physical Therapy Management for a Patient with Tensor Fascia Latae Pain

Reanna Marquez

Background and Purpose: The purpose of this paper is to explore the physical therapy management of tensor fascia latae pain related to compensatory movement patterns, and how it may result in further orthopedic impairments.
Setting: Treatment was provided at an outpatient, orthopedic physical therapy clinic that specialized in manual therapy.
Case Description: The patient was a 56-year-old female with L lateral and anterior hip pain causing difficulty walking, standing, balancing, and sleeping. Her medical history included L ACL removal, L Baker's cyst, an unspecified R big toe surgery, R hip resurfacing, and a neuroma in between L toe 3-4.
Outcomes: The 8 week follow up revealed hip mobility and strength alleviated TFL pain and improved biomechanics of functional movements.
Discussion and Conclusion: This case highlights the importance of hip strengthening and mobility for tensor fascia latae myofascial pain. Lower extremity chain injuries on the same side from a prior injury may be correlated and can be hypothesized that distal joint pain is important to consider. Prior injuries may contribute to chronic impairments including strength deficits that may put other joints or muscles on the same side at risk of strain from compensations. Determining correlation can be found through testing and finding and addressing impairments on the ipsilateral or contralateral side, and reassessing to know if they are correlated. Clinicians should identify any deficits or imbalances in range of motion and strength that may be impacting functional movements thus causing pain.

Key Words: tensor fascia latae, ACL deficiency, lateral hip pain, physical therapy

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Physical Therapy Management of an Adult Female with Ulnar Neuropathy: A Case Report

Maxwell Ngo

Background and Purpose: Ulnar neuropathy is the second most diagnosed focal neuropathy after carpal tunnel syndrome, affecting approximately 17.2 per 100,000 in females. The etiology of ulnar nerve lesions at the elbow include a variety of possible causes, such as acute trauma, nerve compression, traction, or friction from leaning on the elbow or from prolonged elbow extension. The purpose of this case study was to evaluate the effect of a multifactorial treatment approach in a person with ulnar neuropathy and additional comorbidities.
Setting: Treatment was provided at an outpatient, orthopedic physical therapy clinic that treated the general public.
Case Description: The patient is a 52-year-old female referred to physical therapy for bilateral shoulder, elbow, neck pain from her primary physician. Her main complaint was bilateral hand numbness with bilateral medial elbow tenderness. Key impairments included hypermobility in bilateral elbows, periscapular weakness and scapular dyscoordination, and generalized weakness in bilateral upper extremities. Interventions included periscapular strengthening, neural mobilizations, pain neuroscience education, and recommendations for activity modifications.
Outcomes: The patient showed functional improvements and reported slight decrease in pain and increase in functional daily performance, evidenced by QuickDASH scores.
Discussion and Conclusion: Several factors may have impacted this patient's outcomes, including the need for a more robust pain neuroscience education program, formally addressing sleep habits, and a better understanding of the patient's comorbidities and how it may have a played a role in rehabilitation. Further researched is needed to help determine the best treatment approach for patients with similar presentations.

Key Words: ulnar neuropathy, systemic lupus erythematosus, orthopedics

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Efficacy of Physical Therapy Management on Polymyositis

Abel Nigussu

Background and Purpose: Polymyositis is a disease that involves the inflammation of mainly proximal musculature of the limbs that results in weakness, pain, and fatigue along with systemic involvement. Studies have shown that physical therapy is a safe and effective tool to help reduce inflammation and improve function. The purpose of this paper is to discuss the case of a 52-year-old female with polymyositis and to investigate the effectiveness of strength and aerobic training on health, function, and quality of life.
Case description: The patient was a 52-year-old female referred to physical therapy due to a diagnosis of polymyositis. The patient was treated with low intensity aerobic and strengthening exercises, manual therapy techniques, neuromuscular reeducation, and patient education. **Outcomes:** After 10 treatment sessions, the patient showed limited improvements in upper and lower extremity strength and ROM. However, the patient did show some improvements in function as evident by improvements in the TUG test from 33.46 seconds to 28.24 seconds, the 2 min walk test from 114 feet to 140 feet, and the LEFS from 11/80 to 12/80.
Discussion and conclusion: The patient had several comorbidities and also frequently missed sessions due to lack of transportation which all may have played a role in the lack of improvements seen in strength, ROM, and function. Despite the minimal improvements seen, the patient's outcome measure scores still indicated a high fall risk and severe functional limitation.
Key Words: Polymyositis, Physical Therapy, Rehab, Exercise, Inflammatory myopathies

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The treatment of a complex patient with muscle weakness due to a COVID-19 infection

Minha Park

Background and Purpose: COVID-19 caused significant health risks and increased hospitalization in 2020, especially for elderly patients. Even after treatment, patients often had secondary impairments, including muscle weakness. This case study examined the effects of rehabilitation treatment on a geriatric patient who had COVID-19 and developed muscle weakness.

Setting: A skilled nursing facility.

Case Description: The patient was a 90-year-old man with multiple comorbidities and a history of COVID-19 infection. After treatment in the ICU for his respiratory symptoms, he had residual musculoskeletal weakness. This weakness limited his ability to perform daily activities (ADLs) such as bed mobility, transfers, and walking. The patient received lower and upper extremity strengthening exercises, bed mobility techniques, stair training, static and dynamic balance tasks, virtual rehab, gait training with perturbations, and patient education.

Outcomes: The patient showed functional improvements in bed mobility, transfers, and ambulation. His score on the Short Physical Performance Battery (SPPB) improved by 5 points, and he walked 426 feet farther in the 6-minute walk test.

Discussion and Conclusion: Physical therapy helped the patient by reducing the assistance required for bed mobility, transfers, and ambulation. He also improved his scores on outcome measurement tests. However, a confounding variable was that the patient also received occupational therapy daily. It is difficult to state how much benefit came from physical therapy alone. More research is needed to determine the specific effects of physical therapy on geriatric patients with COVID-19 and to identify the best treatment plan to improve outcomes.

Impact of Biopsychosocial Factors and Physical Therapy Management of a Patient with an Acute Ischemic Left Pontine Stroke

Keith Pike

Background and Purpose: Strokes, medically termed cerebrovascular accidents (CVAs), constitute a leading cause of death and global disability. This case study investigates physical therapy interventions in an acute care hospital for a patient following an ischemic left pontine CVA. Additionally, it explores the biopsychosocial factors contributing to their stroke and management of rehabilitation services.

Case description: The patient, is a 71-year-old right-handed male from India visiting his daughter, with a medical history of untreated atrial fibrillation (AF), hypertension (HTN), type 2 diabetes mellitus (T2DM), hyperlipidemia, and smoking. Examination revealed mild right hemiparesis, sensory, coordination, balance, and gait impairments, hemi-neglect, dysphagia, and dysarthria leading to difficulties in mobility, activities of daily living (ADLs), and instrumental activities of daily living (IADLs). Physical therapy interventions included mobility and balance training, gaze stability exercises, and patient education. Outcomes: During the patient's five-day hospitalization, improvements were noted in bed mobility, transfers, and walking. Discharge to an acute rehabilitation unit (ARU) was recommended by the treatment team, however, insurance constraints resulted in discharge to home with home health services.

Discussion/Conclusion: This report examines the influence of risk factors on stroke management and the impact of insurance on discharge decisions. It emphasizes the benefits of early stroke rehabilitation interventions in acute care settings and compares discharge placement to an ARU versus home health services. Collaboration among interdisciplinary team members and identification of optimal discharge placements in acute care settings are critical for ongoing recovery, enhancing functional independence, and addressing medical and biopsychosocial factors affecting patient's health.

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Exploring School-Based Physical Therapy for A Child with Cerebral Palsy

Amphone Rasasombath

Background and Purpose: Cerebral palsy (CP) is a common congenital movement disorder with a spectrum of impairments and severity. School-based physical therapy provides services to help children with disabilities access their education in the school environment. CP is seen in 35% of school-based physical therapy cases.[1] The purpose of this case study is to explore evidence-based physical therapy interventions for a student diagnosed with CP.
Setting: A pre-school classroom in a school environment with a total of 12 students and 3 staff.
Case Description: The subject was 4-year-old female diagnosed with CP categorized as Gross motor Function Classification system level V with spasticity affecting all four extremities. She presented as a complex case with impairments involving multiple systems and emerging skills while having significant global motor delays.
Outcomes: DAY-C outcome measurement was used to determine what services the subject required assistance to access the school environment. After 6 visits, the subject did not make significant improvements in functional mobility, but was able to improve access to her educational environment with a change of equipment.
Discussion and Conclusion: Schools integrated professionals support student's participation and access to school environment. There were limited research guidelines in school-based physical therapy interventions. However, emerging guidelines are exploring practice guidelines within the field.

Key Words: cerebral palsy, school-based physical therapy, cerebral palsy interventions

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Physical Therapy Management of a Patient with Acute Exacerbations of Chronic Inflammatory Demyelinating Polyneuropathy.

Sofia Lowe Rodriguez

Background and Purpose: The impact from peripheral neuropathies, such as chronic inflammatory demyelinating polyneuropathy (CIDP), can lead to long term disability and decreased quality of life. This case study examines the effects of physical therapy management of CIDP in combination with pharmacology intervention. Additionally, the importance of early intervention to limit the effect of the damage to the peripheral nerves to improve quality of life and function.

Case Description: The patient in this case report is a 64-year-old male who presents to an Outpatient Neuro Physical Therapy clinic with a medical diagnosis of CIDP for lower extremity weakness (L<R), gait, and balance abnormalities who experiences frequent falls (about once a week). Throughout treatment, the patient was receiving intravenous immunoglobulin (IVIG) treatment biweekly and experienced two acute exacerbations of his condition. Physical therapy treatment focused on strength training with addition of balance and aerobic training.

Outcomes: The patient demonstrated functional improvement, strength, balance, decreased fall frequency, and decreased pain. However, his scores on the Lower Extremity Functional Scale and Focus on Therapeutic Outcomes survey improved slightly and did not meet the minimally clinically importance improvement.

Discussion and conclusions: This case study demonstrates the benefit of receiving physical therapy long-term in conjunction with pharmacological intervention by maintaining function between the fluctuation of the disease recovery/progression. More research is indicated to determine effective rehabilitation interventions for patient with CIDP with or without combined pharmacological treatment.

Key Words: Chronic Inflammatory Polyneuropathy, Physical Therapy, rehabilitation

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The Effects of Treadmill Training Alongside Task-Specific Training on Gross Motor Function for a Child with Hypotonic Cerebral Palsy and a Rare Genetic Condition

Anyssa Ruiz

Background and Purpose: Cerebral Palsy is a permanent neurologic condition due to an injury in the fetal or infant brain. The Gross Motor Function Classification System E&R is a 5-level classification system that rates its severity. There are also five different main classifications of cerebral palsy based on its presentation. The purpose of this case study is to explore gross motor function, specifically focusing on the goal of independent walking, in a child with hypotonic cerebral palsy and a chromosome duplication. Setting: Treatment was provided at an early intervention clinic.

Case Description: The patient was a 2-year, 7-month-old male who was referred to early intervention services due to his diagnoses of hypotonic cerebral palsy, chromosomal duplication, severe astigmatism, and exotropia of the left eye. He presents at a GMFCS level II with global hypotonia, delayed gross motor milestones with poor global strength, and difficulty with dynamic balance tasks. His family's main goal was to facilitate increased independence with walking. The intervention focuses on walker navigation, walker transitions, transfers, navigating stairs, sitting balance, and independent stepping facilitated by a treadmill training program.

Outcomes: The patient showed a 4% improvement on the GMFM, a slight decrease in participation score, a 304.35% increase in walking speed, and improved function, strength, and gait mechanics. **Discussion and Conclusion:** Several factors impacted the patient's outcomes including the collaboration of care and the environment of therapy. Future research is needed to help determine more specified treatment approaches for hypotonic cerebral palsy and rare genetic conditions in general.

Key Words: hypotonia, cerebral palsy, early intervention, treadmill training, task-specific training

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Post-Acute Physical Therapy Treatment of Critical Illness Polyneuropathy in a Skilled Nursing Facility

Serra Shelton

Background and Purpose: Intensive care unit acquired weakness (ICUAW), is a common complication of intensive care unit (ICU) stay, affecting up to 67% of those recovering from sepsis. Current research focuses on preventative measures in ICUs, but research studying physical rehabilitation post-discharge is minimal and inconclusive. The purpose of this case report is to determine the efficacy of physical therapy treatment for ICUAW in a post-acute setting. **Case Description:** A 63-year-old female presented to the transitional care unit of a skilled nursing facility with a subset of ICUAW called critical illness polyneuropathy (CIP) after weaning from one month of mechanical ventilation after a severe case of pneumonia. The patient exhibited global weakness and left foot drop, mod to max assist for bed mobility, transfers, ambulation, and self-care activities. Treatment was balance, strengthening, assistive device, and gait training, and referral for a custom ankle foot orthotic to manage foot drop. **Outcomes:** The patient showed remarkable improvement with treatment. She achieved her short-term and long-term goals and discharged independently to her sister's house with plans to return to living alone in her own house shortly with use of assistive device and ankle foot orthotic. **Discussion and Conclusion:** This case report shows a successful course of physical therapy treatment that improved patient function, mobility, and independence while decreasing fall risk of a patient with CIP, and merits further study with a larger sample size and control group to confirm findings and establish physical therapy as the standard of care for CIP recovery.

Key Words: Intensive Care Unit Acquired Weakness, Critical Illness Polyneuropathy, Physical Therapy, Transitional Care Unit, Post-Acute Rehabilitation

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Cervicogenic Headache in a Patient with Long COVID: A Physical Therapy Approach

Tim Song

Background and Purpose: Cervicogenic headaches are commonly misdiagnosed, especially individuals with long COVID. The purpose of this case study was to present a multifocal approach to diagnosis and treatment of a patient with long COVID-related cervicogenic headache.
Setting: The treatment was provided at an outpatient physical therapy clinic specializing in musculoskeletal and orthopedic conditions.
Case Description: The patient, a 52-year-old female, presented with bilateral cervicogenic headaches, severe fatigue, upper extremity weakness, and balance deficits following a COVID-19 infection and diagnosis of long COVID in March 2023. Key impairments included limited cervical spine range of motion, decreased shoulder strength, and impaired balance. Physical therapy interventions included strengthening, neuromuscular reeducation for scapular and cervical kinematics, balance training, cognitive exercises, and manual therapy.
Outcomes: Over 16 visits, the patient reported a significant improvement in symptoms, with her score on the Neck Disability Index (NDI) improving from 44% to 16%.
Discussion and Conclusion: This case study highlights the importance of a thorough evaluation, guided by the development of differential diagnoses, to effectively and efficiently diagnosis cervicogenic headaches in a patient with long COVID. As a result of appropriate diagnosis, a personalized treatment plan effectively managed cervicogenic headaches in our patient with long COVID. Further research is needed to optimize diagnosis and treatment strategies for similar cases.
Key Words: cervicogenic headache, long COVID, differential diagnosis, neurological rehabilitation

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Rehabilitation of a Tibial Plateau Fracture in a Patient who delayed Physical Therapy Services

Kylene Sutton

Background and Purpose: Tibial plateau fractures take extensive time to rehabilitate from, especially in an older adult population. They often lead to gait abnormalities which directly affect health-related quality of life and interfere with returning to work and recreational activities. Regaining range of motion is prioritized above addressing strength and gait abnormalities in patients who follow a normal course of treatment. The purpose of this case study is to examine the need for a change in rehabilitative priorities in patients who delay treatment in order to improve function and quality of life.

Setting: Treatment was provided at an outpatient physical therapy clinic in a rural community.

Case Description: The patient was a 60 year old male with no significant past medical history who presented to outpatient physical therapy services three and a half months post-open reduction internal fixation (ORIF) of a bicondylar tibial plateau fracture. Key impairments included impaired knee range of motion, gait abnormalities, impaired strength, and pain. Interventions included range of motion exercises, strength, task-specific training, and gait training.

Outcomes: The patient did not meet his range of motion goals. The patient had modest gains in functional strength and gait mechanics. Thirty second sit to stand and six minute walk test improved slightly, but the patient was still a fall risk based on these metrics. The patient was not a candidate for manipulation under anesthesia, and was advised by his surgeon to seek total knee replacement surgery to address his deficits.

Discussion and Conclusion: Several factors may have impacted this patient's outcomes, including delaying physical therapy treatment for three and half months after surgical fixation. Further research is needed to examine the effectiveness of prioritizing strength and gait mechanics over range of motion gains in patients who delay physical therapy treatment after surgical fixation of tibial plateau fractures.

Key words: Orthopedics, Schaztker type 5 fracture, Physical Therapy

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Rehabilitation of Bilateral Patellar Tendon Repairs: A Case Study

Madeleine M. Underwood

Background and Purpose: Patellar tendon ruptures disrupt the extensor mechanism of the knee and predominately affect middle-aged biological males. Corticosteroid use, systemic disease, and microtrauma heighten one's pathological risk for patellar tendon rupture. Various surgical techniques are utilized for patellar tendon ruptures and the outcomes of repair are overall positive. This case study examines the outpatient physical therapy rehabilitation of a patient without risk factors who experienced spontaneous bilateral patellar tendon ruptures and subsequent surgical repair.

Case Description: The patient, a 26-year-old male with an unremarkable past medical history, presented to physical therapy two weeks post-operatively from bilateral patellar tendon rupture repairs. At the initial evaluation, he demonstrated limitations in gait pattern, knee range of motion and strength, and poor volitional quadriceps control. Rehabilitation focused on regaining range of motion, normalizing gait, and gradual strengthening. Due to the unclear and poorly directed surgical protocol, some deviations were necessary during rehabilitation.

Outcomes: The patient illustrated improvements with his gait, range of motion, strength, and volitional quadricep activation bilaterally at the conclusion of data collection. He continued to demonstrate limitations in knee extension strength bilaterally. A standardized outcome indicated he was at 54% of his maximum function and he was unable to run or squat. He had not returned to work or sport.

Discussion and Conclusion: Several factors impacted his rehabilitation including the surgical technique, immobilization device, surgical protocol, and laterality of his injury. Continued research on this topic is necessary to produce more effective rehabilitation strategies for individuals with this injury.

Key Words: bilateral patellar tendon rupture, extensor mechanism disruptions, surgical protocol, rehabilitation

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Integration of Cognitive Functional Therapy into Physical Therapy Management for a Patient with Chronic Low Back Pain

Tatum Wong

Background and Purpose: The purpose of this case report is to demonstrate how psychological interventions such as cognitive functional therapy can be combined with conventional exercise in physical therapy to manage chronic low back pain.
Case Description: A 24-year-old female presented with chronic low back pain, initially triggered by tennis, and recurred without clear cause. MRI showed disc bulges at L4-L5 and L5-S1. Physical therapy initially failed, with pain resolving after seven months of rest, but returned a year later. Upon reevaluation, she reported constant aching LBP and sharp pain in her sacroiliac joints.
Outcomes: Treatment initially focused on symptom modulation, progressing to core strengthening and lower extremity exercises. Psychological barriers became increasingly apparent, which began to be addressed 4 weeks after initial evaluation, through pain neuroscience education and cognitive functional therapy. After 8 weeks, she was able to weightlift without pain and exhibited mild improvement in fear avoidance behavior. Though the Modified Oswestry Index remained unchanged, she reported decreased pain intensity and improved well-being.
Discussion and Conclusion: This paper highlights the importance of early identification and treatment of psychosocial barriers of chronic low back pain. To improve management of chronic low back pain, clinicians should consider normalizing using outcome measures such as Start Back Tool and Fear Avoidance Behavior Questionnaire at initial evaluation for patients with chronic low back pain to screen for psychological distress, and consider cognitive functional therapy for those that are appropriate.

The Importance of Comprehensively Integrating the Biopsychosocial Model when Establishing Care with the Post-operative Patient

Kevin Wu

Background and Purpose: The total knee arthroplasty (TKA) is a commonly performed surgery whose frequency is expected to rise over time. Physical therapy has been shown to be an effective intervention in the recovery process for this procedure, with frameworks like the biopsychosocial model assisting in integrating mind, body, and social environment into treatment. This case examines how the biopsychosocial model can bridge the gap between healthcare providers and patient-specific expectations to optimize patient recovery and outcomes.

Case Description: The patient was a 77-year-old female with a history of chronic knee and back pain presenting to outpatient physical therapy status post left TKA. Throughout treatment, the patient experienced delays and complications due to fear and anxiety stemming from adverse interactions with her healthcare team and broader community. Physical therapy treatment consisted of manual techniques, functional mobility training, passive range of motion (PROM), active assisted range of motion (AAROM), active range of motion (AROM), and strengthening exercises. **Outcomes:** The patient experienced gradual improvements in knee flexion and extension PROM but was unable to reach the PROM end goals. However, the patient met functional mobility goals and demonstrated significant improvements in strength, balance, and gait speed. Ultimately the patient decided to discharge herself from physical therapy.

Discussion and Conclusions: This study supports the alignment of patient and provider expectations throughout the course of treatment, as well as accounting for individual psychological and social needs. Inadequately matching these expectations can lead to anxiety, fear, poor outcomes, and a weak connection between patients and their care tea**m.**

Key Words: Surgery, anxiety, physical therapy, fear

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