UW Medicine
DEPARTMENT OF REHABILITATION MEDICINE

2025 ABSTRACT COMPENDIUM

DPT CAPSTONE SYMPOSIUM

CLASS OF 2025

June 12th, 2025

9:00 AM – 3:00PM

UW Center for Urban Horticulture

UW Medicine
DEPARTMENT OF REHABILITATION MEDICINE

Class of 2025 DPT Capstone Symposium
Thursday, June 12, 2025

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

Room NHS Hall A **Room coordinator: Patti**

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Elijah Turner	The Impact of a Suspected Pre-existing Mood Disorder on Mild Traumatic Brain injury (mTBI) Recovery: A Case Report	Patti Matsuda
10:15 - 10:30	Diana Regalado	Physical Therapy Management of a Polytrauma Patient in a Skilled Nursing Facility Post Motorcycle Accident	Patti Matsuda
10:30 - 10:45	Eric Redona	Rehabilitation of Bilateral Quadriceps Tendon Strain in a Commercial Pilot: A Case Report on Non-operative Functional Recovery	Bernadette York
10:45 - 11:00	Jordan Samford	Associations between the Number of Therapy Visits and Patient Outcomes in Home Health Care	Rachel Prusynski
11:00 - 11:15	**Break**		
11:15 - 11:30	Kevin Doherty-Regalia	Examining Single-Session Effects of Spinal Stimulation and Robotic Exoskeleton Use in Children with Cerebral Palsy	Chet Moritz & Heather Feldner
11:30 - 11:45	Abigail Schreier	Transcutaneous Spinal Cord Stimulation and Exoskeleton- Assisted Walking to Improve Autonomic and Walking Function after Spinal Cord Injury: A Case Study	Chet Moritz & Soshi Samejima
11:45 - 12:00	Grace Huber	Physical Therapy Management of ACL Recovery in Women Using Quadricep Grafts Experiencing Fear of Returning to Prior Level of Function-	Kathleen Cummer
12:00 - 12:15	Alysha Moser	Physical therapy management following an Achilles tendon rupture surgical repair procedure for a young adult: A case report	Kathleen Cummer
12:15 - 12:45	**Lunch**		
12:45 - 1:00	Rachel Enyeart	Utility of the 6-Minute Walk Test for Home Exercise Prescription in Patients with Interstitial Lung Disease	Beth Brown & Claire Child
1:00 - 1:15	Helen O'Meara	Lung Function and Exercise Testing Outcomes for a Randomized-Controlled-Trial of Remotely-Monitored Exercise in Pulmonary Fibrosis	Beth Brown & Claire Child
1:15 - 1:30	Najite Achebo	Physical Therapy Management of Competitive Volleyball Player with Grade II Hamstring Strain	Ellie Ostrand
1:30 - 1:45	Jasmine Meline	Post-operative Physical Therapy Management of Active-Duty Service Member After Simultaneous Bilateral Total Knee Arthroplasty	Ellie Ostrand
1:45 - 2:00	**Break**		
2:00 - 2:15	Calista Chau	Physical Therapy Management of Return-to-Running with Hypotonic Pelvic Floor Dysfunction	Sarah Keiser
2:15 - 2:30	Drew Gehring	Physical Therapy Management of a Veteran with Knee Osteoarthritis and Type 2 Diabetes Mellitus	Megan Scudder
2:30 - 2:45	Cammy Stukel	Physical Therapy Management of a Patient with Chronic Superficial Infrapatellar Bursitis: A Case Study	Megan Scudder
2:45-3:00	Nathan Ikhitte	Bridging Pain to Performance: Post-Operative Rehabilitation Following Hip Labral Repair in a Recreational Athlete	Megan Scudder

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Room NHS Hall B **Room coordinator: Murray**

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Liz Han	PT Management of an Adult Patient with Delayed Mobilization Following Tibial Spine Fracture	Kurt Williams
10:15 - 10:30	Andrew Evans	Personal and Environmental Factors in the Management of Polytrauma: Homelessness, Substance Abuse, and Rehabilitation Challenges	Kurt Williams
10:30 - 10:45	Haven Dang	Delayed Physical Therapy and AMI in a Middle School Female Athlete After ACL and Meniscal Surgeries: A Case Report	Kurt Williams
10:45 - 11:00	Nicole Ying Smith	The Effectiveness of Frontal Plane Adaptability in a Novel Foot Prosthesis for People with Above-Knee Amputations, Bilateral Amputations, or Limited Mobility	Murray Maitland
11:00 - 11:15	Break		
11:15 - 11:30	Benjamin Bloom	Physical Therapy Management of a Patient with Chronic Low Back Pain with Radicular Pain Post-Lumbar Fusion	Murray Maitland
11:30 - 11:45	Emily Wilson	Physical Therapy Management of Medial Epicondylalgia: Blending Movement System Impairment and Tissue-Based Diagnoses	Murray Maitland
11:45 - 12:00	Xiaoyuan Hu (Sue)	Decreasing Work-Related Injuries in Gastrointestional Endoscopy Through Physical Therapy	Sarah Kaiser
12:00 - 12:15	Olivia Dominguez	Palpable Segmental Pain Associated with Cervical Hypermobility in Patients Presenting With Neck Pain and Suspected Clinical Cervical Instability	Sarah Kaiser & Sean Rundell
12:15 - 12:45	Lunch		
12:45 - 1:00	Brea Francis	Physical Therapy Management of ACL Reconstruction: A Case Report	Janis McCullough
1:00 - 1:15	Chloe Lee	Physical Therapy Management of Pelvic Floor Dysfunction and Hip Pain in a Postpartum Patient: A Case Report	Janis McCullough
1:15 - 1:30	Jordan Olivares	Assessing Right and Left Foot Dimensions Using 3D Scanning: Anthropometric Asymmetries and Their Clinical Relevance	Cristine Agresta
1:30 - 1:45	Dassni Rodriquez	Exploring the Impact of Delayed Access to Physical Therapy and Misunderstanding of Weight-Bearing Protocols after Undergoing a Tibial Intramedullary Rod Insertion: a case study	Torey Gilbertson
1:45 - 2:00	Break		
2:00 - 2:15	Jake Ferry	The Importance of a Therapeutic Alliance in Physical Therapy for a Patient with Achilles Tendinopathy	Adam Babitts
2:15 - 2:30	Dory Schneider	Physical Therapy Management of a Patient with Chronic Achilles Tendinopathy and Proposed Strategy to Reduce Re-Injury	Adam Babitts
2:30 - 2:45	Nikole Pham	Physical Therapy Management of an Active Adult with Chronic Plantar Fasciitis and Posterior Tibialis Tendonitis	Lisa Diller
2:45 - 3:00	Michaela Abueg	Physical Therapy Management of Pediatric Patient with Severe Traumatic Brain Injury in Inpatient Rehabilitation	Kate Rough

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Room NHS Hall C **Room coordinator: Sujata**

TIME	STUDENT	PROJECT DESCRIPTION	ADVISOR
10:00 - 10:15	Meghna Shankar	Developing a Virtual Reality Platform to Assess and Treat Freezing of Gait in Parkinson Disease	Val Kelly
10:15 - 10:30	Dana Christie	Effects of visual vestibular conflict on postural control in people with Parkinson disease	Val Kelly
10:30 - 10:45	Torrance Lee	Physical Therapy Considerations Post-Operative Brostrom Lateral Ankle Reconstruction & Lateralizing Calcaneal Osteotomy for Chronic Ankle Instability	Lin Ya Hsu
10:45 - 11:00	Cameron Smith	Physical Therapy Management of a Patient in a Skilled Nursing Facility status-post Multiple Abdominal Surgeries Presenting with Additional Comorbidities	Lin Ya Hsu
11:00 - 11:15	Break		
11:15 - 11:30	Jenna Yee	Pulmonary Rehabilitation for Patients with Progressive Chronic Pulmonary Disease Awaiting Transplant in the Inpatient Setting	Mark Nelson
11:30 - 11:45	Amber Tharp	Using Translational Research to Guide Early Mobilization in a Heart Transplant Patient with Multisystem Impairments: A Case Report	Mark Nelson
11:45-12:00	Lawrence Haddad	Physical therapy management of low back pain and persistent spinal pain syndrome post lumbar laminectomy and spinal fusion	Michele Cangialosi
12:00-12:15	Nicole Lerch	Physical therapy management of complex regional pain syndrome following lateral ankle surgery: A case report	Michele Cangialosi
12:15 - 12:45	Lunch		
12:45 - 1:00	Connie Zhang	Physical Therapy Management of a Lumbopelvic Pain in a Pregnant Woman	Michele Cangialosi
1:00 - 1:15	Nathan Swanson-Dinsmore	A Reflection on the Management of Lateral Medullary Syndrome in an individual who is deaf and blind from a Physical Therapy Perspective	Jenny Chang
1:15-1:30	Preston Bradley	Conservative Management of Foot drop Secondary to Lumbar Spinal Stenosis and Chronic L5 Radiculopathy: A Case Report	Stacia Lee
1:30 - 1:45	Tiffany Li	Perceptions of Co-Designed Switch Kits to Increase Accessibility for Children with Complex Mobility Needs.	Heather Feldner
1:45 - 2:00	Break		
2:00 - 2:15	Avni Sisodiya	Impacts of the Trexo Robotic Exoskeleton on Caregiver Perceptions of Children's Mobility: A Qualitative Study	Heather Feldner & Chet Moritz
2:15 - 2:30	Yesenia Cooley Pascual	Early Powered Mobility for Toddlers with Developmental Delay or Disability:	Heather Feldner
2:30 - 2:45	Annalissa Hartsell	Go Your Own Way: Driving Behaviors and Social Interactions of Children Learning to Use Powered Mobility	Heather Feldner
2:45 - 3:00			

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

Research Projects

Case Report

Effects of virtual visual perturbations on postural control in people with Parkinson disease

Dana Christie

Background: People with Parkinson disease (PD) may rely on visual cues, despite known visual impairments, for postural control. This may contribute to increased postural sway during sensory conflict, and freezing of gait and falls. Current virtual reality (VR) technology can provide varied visual perturbations in simulated naturalistic environments to examine potential contributions of visual dependence on balance and gait impairments among people with PD.

Purpose: Develop a virtual environment and visual perturbations; compare effects of translational and rotational perturbations to unperturbed standing in healthy adults (HA) and participants with PD.

Methods: A virtual hallway with strong vertical and horizontal lines and contrasting blocks of color was created on a gaming platform. Researchers developed sequences of translational and rotational visual perturbations of varying speeds/magnitudes in the AP direction and delivered them via VR headset. Postural sway data: AP center of mass (CoM) displacement during three 30s standing trials under three conditions: no perturbation, translational perturbations, rotational perturbations. Participants: seven HA (aged 69.3±10.3) and eight with PD (67.3±7.9) meeting requirements for safe participation.

Results: Participants reported no increase in simulator sickness. Among HA participants, average AP CoM displacement was 2.3cm in the static condition, 2.5cm during rotational perturbations, and 2.7cm during translational perturbations. For PD participants, CoM displacement was 2.2cm static and 2.5cm rotational/translational.

Conclusion: Visual perturbations resulted in increased AP sway in HA and people with PD. Future work: incorporating multi-directional visual perturbations for standing and walking in varied virtual environments and assessing the impacts of visual perturbations in people with PD who experience freezing.

Clinical relevance: Understanding the impacts of visual perturbations can inform our understanding of how visual reliance impacts balance and gait impairments in people with PD. VR provides a platform to create dynamic, multi-directional perturbations during standing and walking that can be implemented across simulated naturalistic environments.

References:

1. Berliner, J. M., Kluger, B. M., Corcos, D. M., Pelak, V. S., Gisbert, R., McRae, C., Atkinson, C. C., & Schenkman, M. (2020). Patient perceptions of visual, vestibular, and oculomotor deficits in people with Parkinson's disease. Physiotherapy theory and practice, 36(6), 701–708. https://doi.org/10.1080/09593985.2018.1492055
2. Besharat A, Imsdahl SI, Yamagami M, et al. Virtual reality doorway and hallway environments alter gait kinematics in people with Parkinson disease and freezing. Gait Posture. 2022;92. doi: 10.1016/j.gaitpost.2021.12.013
3. Bohnen, N. I., Roytman, S., Griggs, A., David, S. M., Beaulieu, M. L., & Müller, M. L. T. M. (2022). Decreased vestibular efficacy contributes to abnormal balance in Parkinson's disease. Journal of the neurological sciences, 440, 120357. https://doi.org/10.1016/j.jns.2022.120357
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A descriptive analysis of the communication and socio-emotional behaviors of new powered mobility learners

Yesenia Cooley Pascual

Background: The onset of self-initiated mobility (SIM) in children catalyzes changes across developmental domains including communication and socio-emotional behavior. Socio-emotional skills can be predictive of adaptive functioning, mental well-being and QOL. For children with mobility disabilities, SIM may be explored through a powered mobility (PM) device. There has not been extensive investigation of how communication and socio-emotional development may evolve for new PM learners.

Purpose: This project aimed to describe how communication and socio-emotional behaviors emerged and evolved during PM learning for young children with disabilities.

Participants: Six children ages 14 –31 months (M=20.8) with mobility disabilities and their caregivers.

Method: Children engaged in 12 lab-based PM, video-recorded driving sessions using a Permobil Explorer Mini. Video coding was conducted independently by 3 research team members using a behavioral coding scheme, leading to 21,864 observations. Results were analyzed using descriptive statistics and qualitative content analysis. Inter-rater reliability was established at ≥ 90% agreement.

Results: Communication strategies used by children driving were largely non-verbal. Quantitatively, there were no instances of crying, and rates of neutral and laughter/happy vocalization stayed consistent, with <1% variance across visits. For socio-emotional behaviors, on average neutral facial expressions increased (M=4.6%, range –18.6% to 22.4%), with <1% variance for both smiling and frowning.

Conclusion: A short-term PM intervention for new drivers was well-tolerated from a communication and socio-emotional standpoint. Children demonstrated consistent ranges in communication and emotion. This may indicate that a 12-visit intervention may not be sufficient to observe cascading developmental effects of SIM using a PM device. Further research on dosing is warranted.

Clinical relevance: SIM supports communication and socio-emotional development in children under 3. PM may provide opportunities to decrease gaps in social-emotional delays for children. Clinicians should consider early PM training to meet developing social-emotional needs of children with disabilities.

References:

1. Plummer T, Logan SW, Morress C. Explorer mini: infants' initial experience with a novel pediatric powered mobility device. Phys Occup Ther Pediatr. 2021;41(2):192-208. doi:10.1080/01942638.2020.1819935
2. Feldner H. Impacts of early powered mobility provision on disability identity: A case study. Rehabil Psychol. 2019;64(2):130-145. doi:10.1037/rep0000259
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Examining Single-Session Effects of Spinal Stimulation and Robotic Exoskeleton Use in Children with Cerebral Palsy

Kevin Doherty-Regalia

Children with cerebral palsy (CP) demonstrate neuromuscular impairments such as muscle weakness, shortened muscles, spasticity, and impaired motor control. The integration of novel technologies introduces a promising direction for treatment; however, current evidence is limited. The Trexo is a powered robotic exoskeleton attached to a gait trainer designed to support therapeutic walking exploration. Transcutaneous spinal cord stimulation (tSCS) is a non-invasive method to reduce spasticity and improve muscle coordination. Pairing these two interventions provides a novel opportunity to investigate how technologies may combine to impact body structure and function in children with CP who have emerging or limited walking capabilities. Children completed up to 5 sessions of therapeutic walking with the Trexo. Each session consisted of 2 trials lasting 10-15 minutes. Trials were randomized and included walking at a fixed speed with the Trexo only or walking with the Trexo + tSCS. Spasticity was measured and quantified by summing Modified Ashworth Scale (MAS) scores for hamstrings, quadriceps, gastrocnemius, and soleus in both lower extremities. Passive range of motion (PROM) was measured via goniometric measurements at the hip, knee, and ankle. Pre- and post-intervention MAS scores and PROM measurements were compared for each child's first session. MAS score changes were observed, however, were highly individualized by both participant and muscle group. Post-intervention normalized MAS scores reflected a mean reduction in spasticity of 0.5 points across all muscle groups with a range -0.5 to 2.5 points. Three participants demonstrated a mean five-degree improvement in dorsiflexion PROM and mean four-degree improvement in knee flexion PROM post-intervention. In this pilot study, reductions in spasticity were observed in lower extremity muscles after a single session walking in the Trexo with and without tSCS. PROM also improved for some children. The results underscore the potential for effectiveness of these technologies to support enhanced mobility and participation.

References:

1. Samejima S, Caskey CD, Inanici F, et al. Multisite Transcutaneous Spinal Stimulation for Walking and Autonomic Recovery in Motor-Incomplete Tetraplegia: A Single-Subject Design. Phys Ther. 2022;102(1):pzab228. doi:10.1093/ptj/pzab228
2. McCormick A, Alazem H, Hunt C, Zaidi S, Dixon C. Robotic Walkers for Children and Youth with Cerebral Palsy: A Review of Past Successes and Ongoing Advancement. International Conference of Control, Dynamic Systems, and Robotics. Published online June 2019. doi: https://doi.org/10.11159/cdsr19.128
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Palpable Segmental Pain Associated with Cervical Hypermobility in Patients Presenting With Neck Pain and Suspected Clinical Cervical Instability

Olivia Dominguez

Background: Signs and symptoms for a diagnosis of clinical cervical spine instability (CCSI) are not commonly studied, making diagnosis challenging. Identifying characteristics associated with objective segmental hypermobility can improve the diagnostic process and facilitate improved outcomes for this patient population with earlier, evidence-based intervention.
Purpose: The purpose of this study is to identify if palpable facet joint pain in the cervical spine is associated with hands-on findings of hypermobility at the same level to inform criteria for the diagnosis of clinical cervical spine instability (CCSI) in patients presenting with neck pain or headaches. Subjects: 20 participants (18 female, 2 male).
Materials/Methods: We performed a cross-sectional study including a one-time survey of participants and a medical record review of their exam findings. Potential participants presented to a local physical therapy clinic with primary complaints of headaches and/or neck pain and underwent manual stress-testing for cervical segmental hypermobility. The survey included questions about demographics, medical and social history, and symptom presentation. We abstracted participants' medical records for objective measures of pain with palpation and hypermobility. The primary outcome was hypermobility at cervical segments. We used descriptive statistics and generalized estimating equations, adjusted for age and sex, for analysis.
Results: The adjusted odds of experiencing pain reproduced with palpation at a hypermobile segment were 3.54 times higher compared to a non-hypermobile segment (95% CI: 1.15–10.95; p = 0.028). Conclusion: We conclude there is an association between cervical segmental hypermobility and palpable pain at the same level. Despite statistical significance, these findings had a wide confidence interval, indicating further research is required to make more precise conclusions. Future research will include larger sample size, as well as additional research questions to develop clinical diagnostic criteria for efficient diagnosis of cervical segmental hypermobility.

References:

1. Blanpied, P. R., Gross, A. R., Elliott, J. M., Devaney, L. L., Clewley, D., Walton, D. M., Sparks, C., & Robertson, E. K. (2017). Neck pain: Revision 2017. *Journal of Orthopaedic & Sports Physical Therapy*, *47*(7). https://doi.org/10.2519/jospt.2017.0302
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Utility of the 6-Minute Walk Test for Home Exercise Prescription in Patients with Interstitial Lung Disease

Rachel Enyeart

Purpose: Individuals with interstitial lung disease (ILD) commonly present with exertional hypoxemia (EH), negatively impacting exercise tolerance and habitual physical activity. We recently reported that a remotely monitored home exercise program effectively increases physical activity in two populations with ILD, idiopathic pulmonary fibrosis (IPF) and lymphangioleiomyomatosis (LAM). This study examines the utility of baseline clinical data to identify patients at greater risk for EH during home exercise.

Subjects: 27 adults with ILD, including 9 males and 4 females with IPF enrolled in randomized control trial, and 14 females with LAM enrolled in a single-arm study.

Materials and Methods: The 12-week remotely monitored home exercise intervention included tailored progressive aerobic (3x/week) and resistive exercise (2x/week). EH during training was characterized by frequency analysis of SpO2 records obtained from medical grade fingertip pulse oximeters (Nonin Medical) worn during all workouts. Pre- and post-intervention clinical testing included a 6-minute walk test (6MWT), maximal cardiopulmonary exercise test (CPET), and pulmonary function tests (PFTs). Changes were examined with repeated measures ANOVA or paired t-testing where appropriate, and associations between variables were analyzed using Pearson correlations.

Results: Individuals who exhibited worse EH during home exercise also showed a greater drop in SpO2 during baseline 6MWT ($r=0.54$, $p=0.004$). Interestingly, other baseline 6MWT data were not found to correlate ($p>0.05$) with worse EH, including SpO2 at rest ($r=0.25$) and rest-to-end change in self-reported perceived exertion ($r=0.34$) and dyspnea ($r=0.15$). Similarly, presence of home exercise EH was not related to baseline pulmonary function for forced vital capacity (FVC, $r=0.14$, $p=0.51$) or forced expiratory volume in 1 second (FEV1, $r=0.02$, $p=0.91$).

Conclusions: Examination of oxygen desaturation during 6MWT can be useful in identifying patients at greater risk for EH with home exercise prescription. Subjective reports of exertion and dyspnea during 6MWT, resting SpO2, and standard PFT values are likely not as useful for pre-participation screening for EH.

References:

1. Brown AW, Nathan SD. The value and application of the 6-minute-walk test in idiopathic pulmonary fibrosis. Ann Am Thorac Soc. 2018;15(1):3-10. doi:10.1513/AnnalsATS.201703-244FR
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Go Your Own Way: Driving Behaviors and Social Interactions of Children Learning to Use Powered Mobility

Annalissa Hartsell

Background: Mobility is a human right, and self-initiated mobility is integral to the learning and development of young children. For children with disabilities who do not walk or may be delayed in walking, powered mobility (PM) can be a highly efficient form of self-directed mobility. However, it is underutilized in children under three years old. This delay creates a significant gap in opportunity for children with disabilities to access and participate in play with peers and family, to enter and exit social interactions at will, and to develop agency and identity independent of their caregivers.

Purpose: Investigate the relationship between goal-oriented and exploratory driving behaviors over time and the frequency of child-caregiver interactions in powered mobility learners.

PARTICIPANTS: Six children ages 14-31 months with mobility disabilities.

Methods: This quantitative, lab-based study consisted of 12 visits with two, 15–20-minute video recorded driving sessions, each using the Permobil Explorer Mini in an enriched play space. Behavioral video coding was conducted by three researchers for every six seconds of footage. Descriptive statistics were compared between sessions.

Results: Behaviors were highly variable. On average participants demonstrated a 2.4% increase in goal-directed driving and a 6.7% decrease in child-caregiver interactions across sessions. Average stationary time and object-focused play increased over sessions by 17.7% and 18.6%, respectively.

Conclusions: Results show that the development of goal-directed driving behaviors is highly individualized and may coincide with an increase in object-focused play and a decrease in frequency of direct child-caregiver interactions across sessions. An overall decrease in driving time may relate to children achieving mobility objectives, such as driving to desired toys for sustained play with or without an adult.

CLINICAL RELEVANCE: PM devices such as the Explorer Mini may provide opportunities for independent mobility and play for very young children that can be quantifiably measured.

References:

1. Logan SW, Sloane BM, Kenyon LK, Feldner HA. Powered mobility device use and developmental change of young children with cerebral palsy. Behav Sci. 2023;13(5):399. doi:10.3390/bs13050399
2. Sabet A, Feldner HA, Tucker J, Logan SW, Galloway JC. On time mobility: Advocating for mobility equity. Pediatr Phys Ther. 2022;34(4):546. doi:10.1097/PEP.0000000000000939
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Decreasing Work-Related Injuries in Gastrointestinal Endoscopy through Physical Therapy

Xiaoyuan Hu

Introduction Although ergonomics modifications in healthcare are known to be beneficial, it remains unclear whether endoscopy physicians and nurses recognize their importance or benefit from specific exercises and education to reduce procedure-related injuries.

Purpose This study aimed to assess the feasibility, acceptability, and appropriateness of implementing a physical therapist (PT)-led ergonomic education session and home exercise program (HEP) designed to reduce endoscopy-related injuries in gastroenterologists and endoscopy nurses.

Methods PTs developed an HEP and ergonomics considerations handout targeting common postural and movement faults observed during endoscopy. Participants completed pre- and post-intervention muscle strength and endurance tests for key muscles (abdominals, lower and middle trapezius, serratus anterior, deep neck flexors, and intrinsic hand muscles) and were asked to perform HEP three times weekly for six months. Surveys administered before and after the intervention assessed adherence, feasibility, acceptability, appropriateness as well as perceived effectiveness.

Results 15 participants who enrolled and participated in pre-intervention testing, with seven completing post-intervention testing. There was no significant change in muscle strength except an increase in right lower trapezius muscle strength from 4 to 4.74 ($p<0.05$). 5/8 participants completed HEP to somewhat degree with 1/8 participant completed fully as recommended. Most participants provided positive feedback on education session with 12/13 participants “strongly agree” or “agree” that it was helpful and relevant. All participants reported understanding of the importance of procedural ergonomics and willingness to continue incorporating ergonomics modifications.

Conclusion Collaboration between gastroenterology providers and PTs is feasible to develop an endoscopy-specific wellness program. Further, the intervention was generally well-received though suffered from participant dropout, raising questions regarding intervention feasibility, acceptability, and appropriateness. Future research will iterate the intervention based on pilot feedback and implement the intervention with a larger sample size both multi-institutionally and longitudinally to explore its potential efficacy in decreasing endoscopic injury.

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Perceptions of Co-Designed Switch Kits to Increase Accessibility for Children with Complex Mobility Needs.

Tiffany Li

Purpose/Hypothesis: Play is an integral part of learning and early childhood development. However, independent play is often inaccessible for children with complex mobility needs. Accessible play technologies support increased independence for young children with disabilities. Providing children with complex mobility needs with switch-adapted toys increases access to cognitively appropriate play. Barriers such as lack of availability of switch-adapted toys, high costs, lack of knowledge, and variable function have been reported. Understanding parent and clinician perception of accessible play technologies is critical to improving access and supporting early development. This study aimed to evaluate caregiver and clinician perceptions of switch adapted play technologies for young children with complex motor needs during a co-design experience.

Materials and Methods: During a series of separate, two- hour long co-design sessions with families or clinicians, participants tested switches constructed from household materials, trialed switch- accessible games, and conceptualized switch designs specific to the child. Throughout the session, a semi-structed interview was conducted. Interviews were audio recorded and transcribed verbatim. Inductive coding was completed independently by two researchers until themes emerged.

Results: Six themes emerged from the data: 1) 'Switch kit as an enabler of engagement'2) 'Balancing adaptive play' 3) 'co-design is simultaneously empowering and overwhelming' 4) 'One-size does not fit all'

Conclusion: Currently available AT does not tailor to the unique needs of many children who require EI and is often cost prohibitive. The switch kit was perceived as an obtainable and adaptable technology that encourages clinicians and caregivers to explore additional play options in EI. There is a desire for more low-technology devices that are affordable and designed for EI to support a child's development.

Clinical Relevance: This study adds important qualitative data to support the need for accessible play technology in EI. A customizable switch kit promotes the use of easily attainable and affordable materials to decrease the access burden. Awareness of the switch kit broadens caregiver and clinician perceptions on adapting and utilizing toys for children with complex mobility needs.

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Remote Technologies in Orthopedic Telemedicine: Using a Smartphone App to Quantify Swelling following Acute Ankle Sprains

Jordan Olivares

Purpose: Understanding foot morphology is essential for optimizing footwear and orthotic fit, performance, and injury prevention. While bilateral foot asymmetries are recognized, few studies have evaluated whether these differences extend beyond foot length and width or assessed them using high-precision 3D scanning. This secondary analysis study compared foot anthropometrics between the right and left foot from a previously collected dataset of 3D bilateral foot scans. A secondary aim was to compare foot anthropometrics using 3D scanning and clinical measurement techniques.

Number of Subjects: Fifteen healthy adults (10 W, 5 M) participated in the study. Subjects were free from foot injuries and deformities.

Materials and Methods: Foot anthropometrics—including foot volume, foot length, foot width, instep height, heel width, instep circumference, shank circumference, and malleolar circumference—were captured using a 3D scanner (Academia 50, Creaform, Inc.). Clinical measures of foot length, foot width, ball of foot length, outside ball of foot length, heel width, malleolar circumference and Figure 8 were obtained manually using a soft tape measure and sliding calipers. For digital measurements, subjects sat with their hips and knees at 90-degrees of flexion, placing some weight on the testing foot. Manual measures were taken with either 0% or 50% weight-bearing. Paired t-tests were used to determine significant left-right foot differences. A Pearson's Correlation Coefficient test was used to determine association strength between digital and clinical measurements.

Results: Group-level differences between the right and left foot were small and not statistically significant. However, individual-level differences in foot length and width showed several subjects exceeded standard shoe size fit criteria. Digital and clinical measurements revealed strong correlations ($r > 0.80$), with discrepancies greater for circumferential dimensions.

Conclusions: While group-level asymmetries were not significant, meaningful foot measurement differences related to shoe size underscores the importance of side-specific measurement in orthotic and footwear applications.

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Lung Function and Exercise Testing Outcomes for a Randomized-Controlled-Trial of Remotely-Monitored Exercise in Pulmonary Fibrosis

Helen O'Meara

Purpose: The combined effects of home-based exercise plus antifibrotic therapy on disease progression in idiopathic pulmonary fibrosis (IPF) are unknown. Here we report lung function and maximal cardiopulmonary exercise testing (CPET) outcomes in individuals with IPF stable on antifibrotic therapy, randomized to receive an asynchronous remotely-monitored home exercise program (HEP).
Subjects: 29 adults with IPF on antifibrotic therapy (age 68.5±8 years, 9 female) enrolled in a randomized controlled trial (NCT04838275)
Materials and Methods: After a 4-week run-in period, participants were randomized to receive either a 12-week intervention of progressive aerobic [30 min, 65-75% of heart rate (HR) reserve, 3x/week] and resistance (2x/week) exercise (Arm 1) or monitoring only (Arm 2). Wearable accelerometry/HR monitors (Fitbit Charge 4, Google LLC, Mountain View) and medical grade pulse oximeters (Nonin 3230/3280, Nonin Medical, Plymouth) were utilized. Pre- and post- intervention pulmonary function testing (PFTs) and treadmill CPET were performed. Changes were assessed using ANOVA (time, group, and interaction) and paired T-tests. Data are presented as mean±SD.
Results: High feasibility was reflected by the 100% completion rate, absence of study-related adverse events, and high (92±11%) exercise adherence rate (calculated as % of workouts performed relative to prescribed). Lung function was unchanged by the exercise intervention with similar ($p>0.05$) pre vs. post values for forced vital capacity (FVC, $p=0.30$), forced expiratory volume in one second (FEV1, $p=0.15$), FEV1/FVC ratios ($p= 0.71$), and diffusion capacity of the lung measured with DLCO test ($p=0.15$). In CPET, maximal rate of oxygen uptake (VO2max) declined over 12 weeks (-6%, $p=0.04$) in Arm 2 but not in Arm 1 (+2%, $p=0.50$), indicating better maintenance of aerobic exercise capacity with training. This decline in the unexercised group (Arm 2) also occurred for other variables examined at peak exercise, including ventilatory efficiency as VE/VCO2 ($p=0.007$), METs (metabolic equivalents, $p=0.06$), and HR ($p=0.01$). In the subset of individuals for whom a clear ventilatory threshold (VT) could be determined in pre/post CPETs ($n=16$), variables related to VT were unchanged ($p>0.05$) by training, including time to VT, VO2, HR, METS, and O2 pulse at VT.
Conclusion: A HEP with asynchronous remote monitoring is feasible for patients with IPF on antifibrotic therapy. It promotes better maintenance of aerobic exercise capacity despite no effect on lung function.
Clinical Relevance: Despite the progressive nature of the disease and no improvement of lung function with exercise training, individuals with IPF may slow their decline in exercise capacity by engaging in a remotely-monitored HEP and should be encouraged by the care team where appropriate.
Funding: Investigator-initiated study grant from Genentech, inc. to MBB
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Associations between the Number of Therapy Visits and Patient Outcomes in Home Health Care

Jordan Samford

Purpose/Hypothesis: In 2022, 2.8 million Medicare beneficiaries utilized home health (HH) services, costing $16.1 billion. A new HH reimbursement policy, the Patient-Driven Groupings Model (PDGM), was implemented in 2020. Under PDGM, the number of in-person therapy visits is not considered when setting reimbursement rates, removing incentives for higher volumes of physical (PT) and occupational therapy (OT) visits. Rates are now adjusted based on patients' medical diagnoses, level of function, and need for HH services. Consequently, in-person HH therapy visits declined 18.6% between 2019 and 2022. Patient outcomes are not considered in payment rates, thus the impact of the declines in therapy visits on outcomes is currently unknown. To fill this gap, this study examines the relationships between the number of PT and OT visits and patient outcomes during HH episodes.

Subjects: 269,850 HH episodes during 2019-2022 from a national non-profit HH company with 102 locations in 19 states. Patients were aged 65+ with complete HH assessment data and two or fewer HH episodes.

Methods: Multivariate logistic regression models estimated relationships between the number of PT and OT visits and four patient outcomes: improvements in mobility function, self-care function, community discharge, and transfer to an inpatient facility during the HH episode. Models adjusted for utilization of other services and a comprehensive set of patients' clinical, social, and community factors. Robust standard errors were clustered at the patient level and alpha level was <0.05.

Conclusions: Higher numbers of PT visits during HH episodes were associated with better outcomes across all four measured outcomes. Comparatively, higher numbers of OT visits were associated with smaller improvements in function, but not community discharge or inpatient transfers.

Clinical Relevance: Policies disincentivizing higher volumes of in-person therapy, especially PT, during HH may have negative implications for patient outcomes, particularly for patients requiring longer and higher volumes of services.

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Transcutaneous Spinal Cord Stimulation and Exoskeleton-Assisted Walking to Improve Autonomic and Walking Function after Spinal Cord Injury: A Case Study

Abigail Rose Schreier

Background & Purpose: Transcutaneous spinal cord stimulation (tSCS) is a promising method for promoting functional recovery after spinal cord injury (SCI). Compared to exercise alone, tSCS in combination with exercise results in greater walking and autonomic recovery. This case study assessed the feasibility of pairing tSCS with exoskeleton-assisted locomotor training and its subsequent effects on motor and autonomic function.

Methods: A 50-year-old male with C5, AIS C, chronic spinal cord injury participated in this study. The intervention began with a training period to assess the feasibility and immediate effects of combining tSCS with exoskeleton-assisted walking. The participant then completed a long-term intervention consisting of three phases: 1) exoskeleton-assisted locomotor training only, 2) locomotor training with lumbosacral tSCS, and 3) locomotor training with lumbosacral and cervical tSCS. Outcomes were measured at baseline, after each intervention phase, and at follow-up.

Results: The participant showed an immediate improvement in exoskeleton-assisted walking with tSCS without adverse events. The motor score on the International Standards for Neurological Classification of Spinal Cord Injury increased from 48 after walking alone to 61 after 12 weeks of tSCS paired with locomotor training. Six-Minute Walk Tests distances improved from 18.7m to 25.1m. Bladder capacity increased from 44 mL to 220 mL, and time for bowel management decreased from 39 minutes to 28 minutes. Neurogenic Bladder Symptom Score decreased from 27 to 24 and Neurogenic Bowel Dysfunction Score decreased from 3 to 0. The International Index for Erectile Dysfunction score reported no change in sexual satisfaction and decrease in desire. More notably, the participant reported decrease in occurrence of autonomic dysreflexia at climax and an overall increase in confidence at post-intervention interview.

Conclusion: These findings suggest that tSCS combined with exoskeleton-assisted locomotor training is feasible and impacts walking and autonomic function following incomplete SCI.

Key Words: Spinal Cord Injury, Spinal Cord Stimulation, Autonomic Function, Exoskeleton, Locomotor Training, Walking Function

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Developing a virtual elevator environment to study how spatiotemporal constraints impact walking in Parkinson disease

Meghna Shankar

Background: Many people with Parkinson disease (PD) experience freezing of gait (FoG). Gait impairments are exacerbated when spatiotemporal constraints are added, even in a virtual-reality environment. It is unclear if these effects are specific to those with PD or a feature of aging without a further control group. Virtual reality (VR) technology has potential to support patient-centered treatment by creating realistic FoG-provoking environments for assessment and treatment.

Objective: The first aim was to develop dynamic VR environments incorporating spatiotemporal constraints to replicate FoG-provoking situations. The second aim was to investigate differential effects on gait in healthy adults and people with PD. We hypothesized that dynamic virtual environments with spatiotemporal constraints would worsen gait and FoG in those with PD+FoG.

Methods: The study presented a VR room with an elevator. The static condition consisted of a narrow elevator door that remained open while the dynamic condition added closing doors. An auditory signal sounded two seconds before the doors closed, timed such that participants had to increase their gait speed to 120% to enter the elevator in time.

Results: Participants included eight healthy controls with mean (SD) age of 69.5 (9.5) years and eight participants with PD, without FoG, age of 67.3 (7.9) years. Healthy control walked at an average speed of 1.10 m/s during the static conditions and 1.3 m/s during the dynamic conditions. People with PD, without FoG, walked at 0.09 m/s during the static conditions and 1.05 m/s during the dynamic conditions.

Conclusion: Walking can be safely assessed under realistic conditions with challenging spatiotemporal constraints using VR. People with PD without FoG walked slower than the healthy controls but both groups effectively increased their walking speed.

Clinical Relevance: VR can be used to create environments that provoke gait impairments and FoG and can easily be modified for patient-specific treatment.

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Impacts of the Trexo Robotic Exoskeleton on Caregiver Perceptions of Children's Mobility: A Qualitative Study

Avni Sisodiya

Background: Mobility is a crucial aspect of development for children of all ages to explore and interact with their environment in meaningful ways. However, there is a stark lack of available technologies and supporting evidence for facilitating mobility in children with Cerebral Palsy (CP). The Trexo pediatric robotic exoskeleton is a novel device designed to support therapeutic gait training and participation at critical developmental stages. There is a substantial need for deeper understanding of caregiver perceptions of such devices if they are to be successfully integrated into both therapy and daily life for children with CP.

Purpose: This project evaluated how short-term Trexo use affected caregiver perceptions of mobility and technology for their children with CP.

Number of Subjects: Five caregivers of children ages 23 months to six years old with CP, Gross Motor Classification Function System Levels III-V.

Materials and Methods: Children and families participated in up to six in-lab sessions of mobility play using the Trexo device, set to assist with stepping at a continuous rate. Semi-structured interviews were conducted at study onset and subsequently after each session. Interviews were audio recorded and transcribed verbatim. Interviews were coded inductively and analyzed independently by three research team members until data saturation occurred and themes emerged.

Results: Five themes emerged from the data: 1) 'Empowering Independence' described the Trexo's ability to enhance mobility and autonomy in the form of facilitated movement, 2) 'Enhanced Desire for Mobility' described heightened enjoyment of and comfort with movement in the Trexo, 3) 'Exploration & Enjoyment Prioritization' described purposeful mobility and participation as caregiver movement priorities, 4) 'Promotion of Equity & Inclusivity' described the ability of the Trexo to level the developmental playing field, and 5) 'Device Integration' described benefits, challenges, and caregiver willingness to incorporate rehab technology into therapy and the home environment.

Conclusions: Caregivers prioritized improving body structure & function impairments to increase independence with mobility, environmental interaction, and participation. The Trexo was perceived as supporting increased autonomy and confidence with movement, and enhanced enjoyment of and drive for continued mobility exploration. Caregivers desired further exposure to rehabilitation technology for therapeutic engagement; however, limitations include cost, size, external support required for proper set-up, and lack of widespread availability for which caregivers emphasized a need to invest in continued research.

Clinical Relevance: It is important for clinicians to understand caregivers' mobility priorities and consider options for the use of supportive mobility technology for children with CP. Families and clinicians play a role in advocating for greater access to these emerging technologies that may benefit more equitable mobility and participation.

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The Effectiveness of Frontal Plane Adaptability in a Novel Foot Prosthesis for People with Above-Knee Amputations, Bilateral Amputations, or Limited Mobility

Nicole Ying Smith

Purpose: Foot mobility (MLM), which is essential for walking, turning, and navigating small spaces, is often lacking in prosthetic feet. Individuals with lower limb amputations (LLA) often compensate for the lack of prosthetic foot mobility, leading to changes in step time (ST), step length (SL), and increased fall risk. Although backward walking is known to be more demanding in individuals post-stroke, it has not been extensively studied in people with LLA. This study aims to determine whether increasing prosthetic foot MLM improves backward and sidestepping performance compared to participants' usual prosthetic foot (UF).

Participants: Twenty-nine individuals participated in this preliminary analysis, including those with bilateral LLA (n=6), transfemoral amputations (n=19), and transtibial amputations at K2 mobility level (n=4). The mean (SD) age was 54.4 (13.4) years, and 13 participants reported a fall in the past six months.

Methods: Participants attended four sessions spaced approximately two weeks apart. They used their UF during sessions one and four and the investigational foot (IF) (META Arc, WillowWood, Mt. Sterling, OH) during sessions two and three. Spatiotemporal data were collected using a pressure-sensitive walkway during the Four Square Step Test (FSST). Paired t-tests compared conditions for total time (TT), transition time (TrT), ST, and SL.

Results: Participants completed the FSST slightly faster with the IF (14.16 s) versus UF (14.84 s). Backward stepping showed decreased ST and TrT, while sidestepping showed slight increases for ST and TrT. SL data were similar. Trends suggest potential improvements with increased prosthetic MLM, though changes were not statistically significant.

Conclusion: Increased prosthetic MLM may enhance multidirectional stepping, reduce fall risk, and benefit from further research. Integrating backward and sidestepping into our clinical assessments can maximize our assessment of functional and diverse movement patterns.

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Physical Therapy Management of Pediatric Patient with Severe Traumatic Brain Injury in Inpatient Rehabilitation

Michaela Abueg

Background and Purpose: Pediatric traumatic brain injury (TBI) can lead to lasting cognitive, motor, and social impairments, impacting independence and quality of life. This case study explores the rehabilitation of a 13-year-old with severe TBI following a motor vehicle accident, emphasizing the role of early, multidisciplinary care in optimizing recovery.

Outcomes: Initially, the patient displayed severe motor and cognitive deficits, requiring full assistance. Over three weeks, interventions targeting cognitive stability, motor recovery, and safety awareness led to notable improvements in mood, attention, mobility, and functional independence, though adherence to precautions remained a challenge.

Discussion and Conclusion: Early, individualized therapy and a multidisciplinary approach were key to recovery. Behavioral management, including a 1:1 sitter and occasional restraints, supported participation. This case highlights the role of structured rehabilitation in improving cognitive and functional outcomes in pediatric TBI. This case underscores the importance of early, individualized, and intensive inpatient rehabilitation in facilitating recovery for children with severe TBI. The findings highlight the role of neuroplasticity in improving motor function, cognitive abilities, and overall independence. A structured, multidisciplinary rehabilitation approach addressing strength, balance, coordination, and cognitive function can enhance functional outcomes and reduce long-term disability. Future research should continue to explore optimal rehabilitation strategies and long-term recovery trajectories in pediatric TBI populations.

Key Words: Traumatic Brain Injury, Pediatric Rehabilitation, Neuroplasticity, Inpatient Physical Therapy, Multidisciplinary Approach, Functional Recovery

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Physical Therapy Management of Competitive Volleyball Player with Grade II Hamstring Strain

Najite Achebo

Background and Purpose: Competitive volleyball players are at high risk for lower extremity injuries, including hamstring strains, which can significantly impair performance. The purpose of this case study was to evaluate the effectiveness of a multifactorial rehabilitation approach for a 26-year-old male competitive volleyball player with a Grade 2 hamstring strain.

Setting: Treatment was provided at an outpatient orthopedic physical therapy clinic.

Case Description: The patient was a 26-year-old male competitive volleyball player who reported right hamstring pain after sustaining an acute injury during a high-level volleyball match. His history included Osgood-Schlatter's disease and prior musculoskeletal injuries. Key impairments included pain during jumping, squatting, and deadlifting, as well as relative weakness in R hamstring strength. The rehabilitation program included blood flow restriction (BFR) training, eccentric hamstring strengthening, manual therapy, and neuromuscular training for lower extremity biomechanics.

Outcomes: The patient demonstrated significant improvements in strength and function, including a reduction in pain during jumping and landing, and an increase in hamstring strength. However, full return to pre-injury performance levels was not achieved within the 5-week treatment period, and the patient reported ongoing functional limitations.

Discussion and Conclusion: The multifactorial approach including BFR, eccentric strengthening, and manual therapy led to functional improvements in the patient, although additional time and sport-specific training were needed for a full return to prior performance levels. Further research is needed to explore optimal rehabilitation strategies for high-level athletes recovering from hamstring strains and related lower extremity injuries.

Key Words: sports rehabilitation, hamstring strain, blood flow restriction, volleyball, eccentric training.

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Physical Therapy Management of a Patient with Chronic Low Back Pain with Radicular Pain Post-Lumbar Fusion

Benjamin Bloom

Background and Purpose: Low back pain is the top cause of disability in the United States, with radiculopathy making up 5-10% of cases. Symptoms that follow dermatomal and myotomal patterns require clear differentiation from referred pain. Following a lumbar fusion, excessive movement in the lumbar segment and decreased movement in the thoracic segment can cause radicular pain. Guideline-based treatment includes motor control exercises, neurodynamics, directional preference exercises, and patient education.

Case Description: The patient was a 70-year-old male with a history of L4-L5 lumbar laminectomy and fusion. He also had cervical radiculopathy. His symptoms began after he performed a twisting motion and felt a crack in his right flank, causing pain around his kidneys and later radicular pain and paresthesia down his left leg. At initial evaluation, he presented with reduced lumbar range of motion, reduced trunk and hip strength and coordination, hyperkyphotic sway-back posture, positive neural dynamic tests and no directional preference. Interventions included core stability and neuromuscular reeducation, lumbar and thoracic mobility exercises, and functional training.

Outcomes: The patient improved in range of motion, strength, postural awareness, and functional activity as measured by the Modified Oswestry Disability Index.

Discussion and Conclusion: Lumbar stability exercises have shown benefits for patients with chronic low back pain and radiculopathy. However, the evidence is limited for those who have undergone lumbar fusion surgery. This case study contributes to emerging research by demonstrating functional gains and symptom reduction in a post-fusion patient through the use of stability, mobility, and manual therapy interventions. Despite initial improvements in pain, function, and activity tolerance, the patient experienced a symptom flare due to life stress, missed visits, and decreased exercise compliance. While pain relief was incomplete, the patient achieved meaningful progress, supporting the potential value of these interventions in similar post-surgical cases.

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Conservative Management of Foot Drop Secondary to Lumbar Spinal Stenosis and Chronic L5 Radiculopathy: A Case Report

Preston Bradley

Background & Purpose: Foot drop is a functionally limiting condition often caused by L5 radiculopathy or peroneal neuropathy. Distinguishing between the two is critical for developing an appropriate treatment plan. This case report presents the rehabilitation of a 33-year-old male with progressive right sided foot drop, gait impairments, and low back pain following a fall. It emphasizes the importance of a multimodal rehabilitation program, recognizing that no single intervention addresses all deficits.

Case Description: The Patient, a new father, was diagnosed with L4-S1 spinal stenosis via MRI and electrodiagnostic testing, which confirmed chronic L5 radiculopathy and right common peroneal motor neuropathy with axonal loss. He demonstrated decreased dorsiflexion and eversion strength, poor balance, and altered gait. The treatment plan incorporated neuromuscular re-education, progressive strengthening, joint mobilizations, balance training, and neuromuscular electrical stimulation (NMES) to recruit tibialis anterior and improve gait function.

Outcomes: Over several weeks, the patient improved in lower extremity strength, balance, and gait mechanics. Functional outcome measures included the 10-Meter Walk Test, Timed Up and GO, and single-leg balance testing. Though some dorsiflexion weakness and gait asymmetry remained, overall mobility and independence with daily tasks improved

Discussion: This Case highlights the importance of clinical reasoning when differentiating L5 radiculopathy from peroneal neuropathy. It supports the role of evidence-based, multimodal rehabilitation – particularly NMES, balance training, core strengthening, manual therapy, and functional retraining – in improving function for patients with chronic radiculopathy- related foot drop.

Keywords:

Foot Drop, L5 Radiculopathy, Peroneal Neuropathy, Spinal Stenosis, Neuromuscular Re-education, Electrical Stimulation.

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Physical Therapy Management of Return-to-Running with Hypotonic Pelvic Floor Dysfunction: A Case Report

Calista Chau

Background and Purpose: The purpose of this case report is to evaluate the effectiveness of a multifactorial treatment approach for recreational return-to-running in a patient with hypotonic pelvic floor dysfunction with primary complaints of stress urinary incontinence (SUI) and pelvic organ prolapse (POP) symptoms. Return-to-running recommendations are primarily focused on the postpartum population. The transferability of these recommendations will be assessed for a patient who is no longer acutely postpartum but experiencing POP and SUI.

Case Description: MH was a 51-year-old female referred for outpatient physical therapy evaluation and treatment of SUI and POP. MH had experienced gradually worsening SUI and rectal pressure over the last 3-5 years with goals to sit, walk, sneeze, cough, and run without SUI or POP symptoms.

Outcomes: Physical therapy included breathing mechanics re-training, abdominal visceral mobilization, pelvic floor muscle training, lower extremity strengthening, load and impact training for return-to-running, and running form alterations. Rehabilitative Ultrasound Imaging was utilized as biofeedback for transverse abdominus and pelvic floor co-activation. At discharge, she met 6/8 of her goals and significantly improved SUI and POP symptoms, scoring 21.88 out of 300 on the Pelvic Floor Disability Index.

Discussion and Conclusions: Incorporation of basic pelvic floor physical therapy, load and impact testing, pelvic floor muscle coordination training, running form alterations, and biofeedback utilized in conjunction can improve SUI and POP symptoms in a population that is no longer acutely postpartum.

Key Words: Pelvic Organ Prolapse, Physical Therapy, Pelvic Floor Muscle Training, Return-to-Running, Stress Urinary Incontinence

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Delayed Physical Therapy and AMI in a Middle School Female Athlete After ACL and Meniscal Surgeries: A Case Report

Haven Dang

Background and Purpose: Anterior cruciate ligament (ACL) and meniscal injuries are common in sports. Several factors influence return-to-sport outcomes, including a strong rehabilitation program. This case examines the impact of arthrogenic muscle inhibition (AMI), delayed physical therapy (PT) initiation, prolonged knee immobilization, and non-weight-bearing (NWB) status in a patient after ACL and meniscus surgeries.

Case Description: The patient was a 14-year-old female middle school athlete who presented to PT 6 weeks post-right ACLR with a quadriceps tendon autograft and medial and lateral meniscal repairs. During this time, the patient was NWB, using crutches, and wore an extension brace 23 hours a day. Evaluation findings included: (1) limited right knee range of motion (10°–70°–0°), (2) abnormal gait with reduced stride length and walking speed, and (3) muscle atrophy contributing to leg weakness, limiting functional activities.

Outcomes: Interventions included (1) range of motion (ROM) exercises, (2) neuromuscular functional simulation (NMES), (3) blood flow restriction (BFR) therapy, and (4) functional strengthening. After 13 weeks, the patient had improved knee flexion ROM and functional activity performance. However, minimal improvement in force production and a worsening 10-degree extensor lag persisted. The intervention was not completed at the time.

Discussion and Conclusions: Additional factors that may have influenced outcomes include an insufficient home exercise program (HEP), limited progressive loading, and psychosocial barriers. Future research should examine the role of tibial rotation in knee mechanics.

Key Words: adolescent, athlete, ACL, meniscus, delayed physical therapy

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Personal and Environmental Factors in the Management of Polytrauma: Homelessness, Substance Abuse, and Rehabilitation Challenges

Andrew Evans

Background and Purpose: Polytrauma resulting from a motor vehicle accident is widespread in the United States. Several goals exist in polytrauma rehabilitation, with the most important being improving patient mobility in conjunction with weight-bearing restrictions put in place. This paper examines early mobilization with a polytrauma patient with multiple factors, including homelessness and substance abuse, impacting her recovery.

Case Description: The patient was a 34-year-old presenting to physical therapy following a motor vehicle accident. The patient was a pedestrian struck by a fast-moving vehicle. The initial trauma included fractures of rib, scapular, pelvic, finger, and femur. These injuries led to global impairments in strength, range of motion, and respiration difficulties. Additionally, the patient was homeless and suffered from opioid addiction, further complicating recovery.

Outcomes: Interventions included bed mobility, transfer training, incentive spirometry, therapeutic exercise, patient education, and wheelchair management. By five weeks, the patient's AM-PAC score increased from 6 to 12, with improvements in non-and low-weight-bearing activities. However, the patient was unable to be placed in inpatient rehabilitation due to a lack of stable housing as well as a substance abuse history.

Discussion and Conclusions: The patient's factors of homelessness and substance abuse lengthened their acute care stay, potentially delaying the next stage of rehabilitation. Functional mobility increased with early mobilization. Future research should address the impact of housing instability on patient recovery and discharge planning, improving planning for treatments in tandem with treatment for substance abuse, and the role of early mobilization in a patient population with significant weight-bearing restrictions.

Key Words: Polytrauma, Homelessness, Opioids, Early Mobilization, Physical Therapy

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The Importance of a Therapeutic Alliance in Physical Therapy for a Patient with Achilles Tendinopathy

Jake Ferry

Background and Purpose: Achilles tendinopathy (AT) can lead to significant functional limitations, including pain during walking, running, and other daily activities. Emerging evidence highlights the importance of the therapeutic alliance (TA) as a key factor in improving adherence and outcomes. Communication and patient education have been consistently identified as critical components of a strong TA, fostering patient engagement and trust. This case report aims to examine how a strong therapeutic alliance, particularly through effective communication and education, influences patient adherence to physical therapy in the treatment of Achilles tendinopathy.

Case Description: The patient is a 38-year-old male who presents to outpatient physical therapy with complaints of acute onset of right Achilles pain that has limited their physical activity and participation. The patient had a poor history with physical therapy that disrupted their trust in the profession. Physical therapy treatment focused on developing a strong therapeutic alliance that was centered around communication and education to improve compliance with physical therapy, along with traditional care that included eccentrics, concentrics, manual therapy, plyometrics, and stretching.

Outcomes: After 6 weeks, the patient reported a self-perceived level of recovery of 8/10 from 2/10 and demonstrated an improvement in single-leg heel raises across 5 visits.

Discussion and Conclusion: This study presents how a strong therapeutic alliance can be incorporated into the plan of care for those with AT. More research is needed to develop guidelines for a therapeutic alliance that can be used in the physical therapy profession.

Key Words: Therapeutic Alliance, Achilles Tendinopathy, Compliance, Physical Therapy, Case Report

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Physical Therapy Management of ACL Reconstruction: A Case Report

Brea Francis

Background and Purpose: Anterior cruciate ligament reconstruction (ACLR) is a common procedure in young, active individuals. Early post-operative recovery may be complicated by joint stiffness, myofascial pain, and psychosocial factors. This case study examined the role of a biopsychosocial approach in early rehabilitation following ACLR using a hamstring tendon autograft.

Setting: Outpatient orthopedic physical therapy clinic specializing in sports rehabilitation.

Case Description: The patient was a 28-year-old male with no prior medical history who sustained an ACL tear during a skiing accident. He was seen two days following initial injury and participated in six weeks of prehabilitation and was followed through six weeks post-operatively. Direct observation and assessment were limited to the acute to subacute phase of rehabilitation, ending at six weeks post-operatively. Initial limitations included knee flexion restricted to 85 degrees and medial knee pain. Post-operative progress was hindered by a myofascial trigger point in the vastus medialis oblique (VMO) and capsular tightness raising concern for arthrofibrosis. The patient also reported emotional distress due to loss of physical activity and a shift in family roles.

Intervention: Treatment focused on restoring range of motion, reducing pain, improving neuromuscular control, and normalizing gait. A corticosteroid injection was administered by the orthopedic surgeon to manage inflammation. Therapy included myofascial release, progressive loading, and functional retraining, with attention to psychosocial factors.

Outcomes: The patient demonstrated modest gains in knee flexion, improved gait symmetry, and slight LEFS score improvement. However, psychosocial barriers and persistent pain delayed return to higher-level activities.

Conclusion: This case highlights the need for a multifactorial rehabilitation approach following ACLR. Addressing both physical impairments and psychosocial stressors in the early phase, was essential in guiding recovery, as they may impact later phases and lead to slower recovery. Additional support, including mental health referral or pain education, may further optimize outcomes.

Key Words: ACL reconstruction, hamstring tendon autograft, myofascial pain, rehabilitation, psychosocial factors

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Physical Therapy Management of a Veteran with Knee Osteoarthritis and Type 2 Diabetes Mellitus

Drew Gehring

Background and Purpose: Knee osteoarthritis (KOA) is a prevalent degenerative joint condition affecting millions of Americans and is exacerbated by comorbidities like type 2 diabetes mellitus (T2DM). Veterans face increased risk due to cumulative joint loading during military service, and uncontrolled diabetes contributes to systemic inflammation and oxidative stress, accelerating joint degeneration. This case study explores the outcomes of a multimodal physical therapy approach for a 59-year-old veteran with bilateral KOA, a medial meniscus tear, and fluctuating glycemic control.

Case Description: The patient presented with bilateral knee pain, antalgic gait, bilateral strength deficits, limited knee ROM, and a pain level of 8/10. He used a cane for short distances and had difficulty with community ambulation and stair navigation. Interventions over two outpatient visits included therapeutic exercises, gait training, patient education, and a home exercise program (HEP). A Transcutaneous Electrical Nerve Stimulation (TENS) unit was introduced for pain management. Glycemic control was not addressed directly in therapy, revealing a gap in interdisciplinary care.

Outcomes: After two visits, the patient demonstrated meaningful gains: a decrease in knee pain, increase in right knee flexion ROM, and increase in bilateral lower extremity strength, which resulted in improvements in community ambulation. Outcomes reflected clinically significant improvements in pain, strength, and functional activities.

Discussion and Conclusions: This case supports the value of individualized, evidence-based physical therapy in managing KOA complicated by diabetes. Functional strength training, gait retraining, and education promoted rapid improvements, while the lack of attention to glycemic management highlights the need for interdisciplinary collaboration. Future care for similar patients should include routine screening of diabetes status and coordinated efforts with medical providers to optimize outcomes.

Key Words: Knee Osteoarthritis, Diabetes Mellitus, Physical Therapy, Veterans, Rehabilitation

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Physical therapy management of low back pain and persistent spinal pain syndrome post lumbar laminectomy and spinal fusion: A case study

Lawrence Haddad

Low back pain (LBP) accounts for approximately 25% of outpatient physical therapy cases and remains a leading cause of disability among adults. While lumbar spinal surgeries such as laminectomy, transforaminal lumbar interbody fusion (TLIF), and posterior spinal instrumentation and fusion (PSIF) are performed to alleviate chronic symptoms, up to 27.6% of patients continue to experience persistent spinal pain syndrome (PSPS). This report describes the outpatient rehabilitation of a 60-year-old male three months post bilateral L2–L3 and L5–S1 laminectomy, TLIF, removal of prior PLIF, and L2 PSIF. His clinical presentation was notable for severe deconditioning, antalgic gait, impaired posture and balance, and radicular pain in the right gluteal region. Comorbidities included obesity, type II diabetes, and prior surgical complications. Functional limitations included restricted ambulation, loss of work, and dependency on a front-wheeled walker. Physical therapy emphasized pain management, core stabilization with transversus abdominis activation, graded strength training, gait retraining, and balance exercises. Patient-specific goals included improved ambulation, reduced pain, and greater independence in activities of daily living. Over six weeks, the patient reported reduced pain intensity, improved upright posture, enhanced balance, and greater gait endurance. These gains were achieved despite intermittent flare-ups and persistent neuropathic symptoms. Patient-reported improvements included reduced fear of movement and increased confidence with ambulation. This case highlights the challenges of post-surgical LBP management, particularly in patients with PSPS and multiple comorbidities. Individualized, graded, and multimodal physical therapy centered on patient goals and symptom tolerance can facilitate meaningful functional recovery. The case underscores the need for expanded clinical pathways and research specific to outpatient rehabilitation in PSPS populations.

Keywords: low back pain, persistent spinal pain syndrome, laminectomy, spinal fusion, physical therapy, post-surgical rehabilitation, case report

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Physical Therapy Management of an Adult Patient with Delayed Mobilization Following Tibial Spine Fracture

Liz Han

Background and Purpose: Tibial spine fractures (TSFs) are a relatively uncommon yet significant injury of the knee, with a reported annual incidence of approximately 3 per 100,000 people. While less frequently encountered in adults, TSFs can result in knee instability and pain, functional impairment, and arthrofibrosis. Due to the higher rates of TSF injury in the pediatric population compared to adults, much of the current literature has been conducted on adolescents. Through a detailed examination of this case, this paper aims to enhance understanding of the challenges faced in diagnosing and treating TSFs, particularly in adult patients, and will explore the mechanisms of injury, diagnosis, treatment, and rehabilitation options for TSFs.
Case Description: The patient was a 22-year-old male who presented to physical therapy for initial evaluation 3 weeks status-post left knee arthroscopic ACL repair with tibial spine fracture fixation and a lateral meniscus anterior root avulsion fracture repair. His postoperative rehabilitation was complicated by a pulmonary embolism several days after surgery and kidney stones a day later that required surgery to remove. Due to these complications, the patient was in the hospital for 10 days and received no physical therapy during his stay. In addition to these complications, he required a manipulation under anesthesia (MUA) 12 weeks post-surgery as well as an arthrocentesis 22 weeks post-surgery.
Outcomes: The patient experienced episodes of mild progress in knee ROM and LE strength but did not demonstrate significant improvements in knee ROM until after the MUA and arthrocentesis were performed.
Discussion and Conclusions: This paper highlights the importance of early ROM mobilization after a TSF. Furthermore, it demonstrates that interventions such as MUAs and arthrocentesis may be very beneficial treatments to aid patients who may be struggling to achieve or maintain ROM progress. Thus, therapists should be aware of the consequences of delayed ROM rehabilitation and the utility of MUAs and arthrocentesis throughout the TSF rehabilitation process. Key Words: Tibial Spine Fracture, Anterior Cruciate Ligament, Physical Therapy

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Physical Therapy Management of ACL Recovery in Women Using Quadricep Grafts Experiencing Fear of Returning to Prior Level of Function- A Case Study

Grace Huber

Background and Purpose: The anterior cruciate ligament (ACL) is a critical knee stabilizer and one of the most commonly injured ligaments, with women at higher risk due to anatomical and hormonal differences. This case focuses on ACL reconstruction using a quadriceps tendon graft, which presents specific rehabilitation challenges, including muscle weakness and fear of reinjury. A holistic, individualized physical therapy approach that addresses both physical and psychological factors is essential to optimize recovery, especially for female patients.

Case Description: The patient is a 28-year-old female who underwent ACL reconstruction following a skiing injury. She presented with pain, swelling, stiffness, limited knee motion, and significant quadriceps weakness, which impaired her ability to work and engage in functional activities. Her treatment plan included manual therapy, neuromuscular re-education, progressive strengthening, gait training, education on her condition, and strategies to address motivation and fear of reinjury.

Outcomes and Conclusions: At three months post-surgery, the patient demonstrated reduced pain and improved stair navigation, but continued to have strength deficits, balance impairments, and psychological barriers limiting her return to full function. Her early non-weight-bearing status contributed to muscle atrophy and delayed recovery. This case highlights the importance of addressing both physical and emotional aspects of rehabilitation and suggests that early muscle activation and consistent psychological support can enhance outcomes following ACL reconstruction.

Key words: quadriceps graft, rehabilitation, fear-avoidance, female specific

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Bridging Pain to Performance: Post-Operative Rehabilitation Following Hip Labral Repair in a Recreational Athlete

Nathan Ikhitte

Background and Purpose: Hip labral tears are a common source of groin pain and functional limitation, particularly in young, athletic individuals. Post-operative rehabilitation following arthroscopic labral repair varies widely due to differences in surgical precautions and clinical protocols. Current literature supports multimodal physical therapy interventions including manual therapy, neuromuscular re-education, and patient education to address pain, improve range of motion (ROM), and restore function. The purpose of this paper is to discuss the case of a 25-year-old male with chronic low back pain and newly developed anterior groin symptoms, later diagnosed as a right hip labral tear, and to investigate the effectiveness of post-operative physical therapy interventions on pain, ROM, and function.

Case Description: The patient, a physically active 25-year-old male, presented with ongoing right hip pain and restricted mobility. Diagnostic imaging confirmed a labral tear, leading to an arthroscopic hip labral repair. Following surgery, he began a structured rehabilitation program focused on pain reduction, restoring hip range of motion, and progressive strengthening to support functional recovery.

Outcomes: After 12 weeks of therapy, GD exhibited increased hip ROM, increased hip strength, and improvements in outcome measures such as Lower Extremity Functional Scale (LEFS), and Numeric Pain Rating Scale (NPRS). The patient also progressed from crutch-assisted ambulation to independent walking and recreational activity with minimal discomfort.

Discussion and Conclusion: This case demonstrates that individualized, evidence-based physical therapy can be effective in restoring function and reducing pain following hip labral repair. The case also highlights a need for more standardized outcome tracking tools specific to post-arthroscopic hip rehabilitation.

Key Words: Hip labral tear, post-operative rehabilitation, physical therapy, neuromuscular re-education, functional outcomes

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Physical Therapy Management of Pelvic Floor Dysfunction and Hip Pain in a Postpartum Patient: A Case Report

Chloe Lee

Background and Purpose: Postpartum women often experience groin pain and pelvic floor dysfunction due to hormonal and musculoskeletal changes. These factors can cause pelvic instability and functional muscle weakness. Early physical therapy focusing on pelvic floor muscle training, hip and core strengthening, and manual therapy is recommended to improve function and reduce pain. This case study presents an evidence-based rehabilitation approach for a postpartum patient with groin pain and pelvic floor dysfunction.
Case Description: The patient was a 38-year-old female, evaluated 10.5 months postpartum, presented with right groin pain, pelvic floor weakness, and difficulty with sitting cross-legged and turning onto her right side. Symptoms began three months postpartum and were exacerbated by childcare-related positions. Evaluation revealed decreased strength in right hip flexion and extension, core strength, and pelvic floor muscle coordination. Treatment included pelvic floor muscle retraining, hip and core strengthening, joint mobilizations, and functional strength training.
Outcomes: After 11 sessions, the patient demonstrated improved strength, reduced pain, and partial achievement of functional goals. Her Pelvic Floor Distress Inventory score improved from 69 to 29, reflecting reduced symptoms. Pain with provocative activities decreased to 2/10, and overall functional mobility improved. However, the patient was discharged early due to insurance loss, and follow-up was not obtained.
Discussion and Conclusions: This case highlights the value of individualized physical therapy in postpartum pelvic floor dysfunction. A comprehensive approach addressing muscle imbalances and functional limitations led to meaningful improvements in symptoms and activity participation. Continued advocacy for postpartum pelvic health services and patient education is essential to optimize long-term outcomes.
Key Words: Pelvic Floor Dysfunction, Postpartum, Physical Therapy, Hip Pain, Core Instability
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Physical Therapy Considerations Post-Operative Brostrom Lateral Ankle Reconstruction & Lateralizing Calcaneal Osteotomy for Chronic Ankle Instability

Torrance Lee

Background and Purpose: Chronic ankle instability (CAI) is one of the most common musculoskeletal injuries in the United States due to its high rate of reinjury. Each instances of reinjury increases the ankle's susceptibility to further damage. Some individuals are predisposed to ankle sprains due to their structural anatomy. This case study examines the outcomes of treatments for CAI, including physical therapy, Brostrom lateral ankle reconstruction, and calcaneal osteotomy.

Case Description: This patient is a 38-year-old female that has been experiencing CAI since she was 15-year-old. She has been to physical therapy multiple times with limited success. Imaging eventually revealed a structural varus hindfoot deformity paired with a hypermobile subtalar joint. Based on these findings, her primary care provider (PCP) recommended a Brostrom and lateralizing calcaneal osteotomy procedure followed by physical therapy management.

Outcomes: The patient was provided with a post-operative rehabilitation protocol with a timeline for physical therapy by her surgeon. However, she started physical therapy five weeks later than recommended, resulting in delays to regaining mobility, strength, range of motion, and weightbearing capacity. Although she gradually began to make progress toward her functional goals, the final outcome is unknown due to the end of the students' rotation.

Discussion and Conclusion: Early-stage CAI can be treated with conservative options such as physical therapy. However, in cases where an individual's anatomical structure predisposes them to recurrent injuries and conservative approaches have limited success, surgical interventions may be a viable alternative. Future research is warranted to evaluate recovery outcomes from a combination of Brostrom and/or calcaneal osteotomy with and without physical therapy to determine the best treatment strategy for CAI.

Key Words: Chronic Ankle Instability, Brostrom Lateral Ankle Reconstruction, Lateralizing Calcaneal Osteotomy, Physical Therapy

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Physical therapy management of complex regional pain syndrome following lateral ankle surgery: A case report.

Nicole Lerch

Background and Purpose: Complex regional pain syndrome (CRPS) is a rare chronic pain condition characterized by intense pain of disproportionate severity to the initial injury or trauma. There is a lack of high-quality research regarding treatment options for individuals with CRPS due to the highly variable nature of the condition. The purpose of this case study is to evaluate the effectiveness of physical therapy interventions in CRPS management.

Case Description: The patient was a 38-year-old male presenting to an outpatient physical therapy clinic following lateral ankle surgery and subsequent development of CRPS. Upon initial evaluation, the patient presented with significant pain and sensitivity of his left foot and ankle, ankle mobility limitations, and an inability to bear weight through his left foot due to pain. Physical therapy treatment focused on desensitization, gait training, and graded motor imagery (GMI) to improve his ambulatory and functional skill capacity.

Outcomes: After twelve weeks of physical therapy, the patient demonstrated improved ambulatory tolerance using a variety of assistive devices, but significant progress towards his ambulatory and functional goals had not been achieved. This may be attributed to a low frequency of visits and a lack of management from other medical disciplines.

Discussion and Conclusions: Due to the lack of high-quality research regarding treatment of CRPS, case studies such as this are often used to inform clinicians on potential treatment options for patients with CRPS. This case study contributes to the gap in knowledge of physical therapy interventions for patients with post-operative lower extremity CRPS. This case study also highlights the need for interdisciplinary care teams to address the multi-faceted aspects of chronic pain diagnoses.

Key Words: complex regional pain syndrome, chronic pain, central sensitization, graded motor imagery.

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Post-operative Physical Therapy Management of Active-Duty Service Member After Simultaneous Bilateral Total Knee Arthroplasty

Jasmine Meline

Background and Purpose: Knee osteoarthritis (OA) impacts millions of people every year. It is predicted that nearly one million total knee arthroplasties (TKA) will be performed in the US in the year 2030. Hospitals may need to establish alternatives to unilateral TKAs to match the demand, and simultaneous bilateral TKAs may be one of those alternatives. The purpose of this case study is to assess if current TKA rehabilitation protocols for unilateral operations are appropriate for bilateral procedures and whether functional outcomes differ.

Patient Characteristics: The patient is a 57-year-old Active-Duty female with 24 years of service in the Army with multiple combat zone deployments. She has a multiyear history of knee pain that was previously treated with arthroscopy and microfractures, corticosteroid injections, and physical therapy. Knee pain persisted and eventually led to multiple falls.

Outcomes: After three weeks of physical therapy utilizing a unilateral TKA protocol, severe edema was well-controlled and the patient was regaining function beyond what was expected. However, pre-surgical knee pain was reported to be present.

Discussion: This case report provides evidence that although no established protocols for bilateral TKAs exist, unilateral TKA protocols can provide similar functional outcomes in the first three weeks of recovery.

Key Words: bilateral simultaneous total knee arthroplasty, post-operative, functional outcomes, rehabilitation protocol

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Physical therapy management following an Achilles tendon rupture surgical repair procedure for a young adult: A case report

Alysha Moser

Background and Purpose: Achilles tendon rupture is a common and functionally significant musculoskeletal injury, particularly in physically active individuals.

Case Description: This case study details the clinical presentation, diagnostic process, surgical management, and rehabilitation of a 38-year-old male who sustained an acute, complete rupture of the left Achilles tendon during a recreational athletic activity. Given the patient's high functional demands and desire for return to sport and tactical function, surgical intervention was selected. An open repair was performed using a Krackow locking-loop technique.

Outcomes: Postoperatively, the patient followed a structured rehabilitation protocol grounded in tendon healing timelines, including initial immobilization, progressive weight-bearing, early mobilization, and targeted strengthening of the gastrocnemius-soleus complex. Emphasis was placed on restoring plantarflexion strength, optimizing gait mechanics, and preventing compensatory movement patterns.

Discussion and Conclusions: This case highlights the biomechanical and physiological consequences of Achilles tendon rupture, the critical role of surgical technique in restoring anatomic and functional integrity, and the importance of a phase-based rehabilitation approach tailored to tissue healing and patient-specific goals. It underscores that a multidisciplinary, individualized treatment pathway can facilitate optimal outcomes, reduce risk of complications, and support successful return to activity.

Key Words: Achilles tendon rupture, Tendon repair, Krackow technique, surgical management, rehabilitation protocol, physical therapy

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Physical Therapy Management of an Active Adult with Chronic Plantar Fasciitis and Posterior Tibialis Tendonitis

Nikole Pham

Background and Purpose: Chronic overuse injuries, such as plantar fasciitis (PF) and posterior tibialis tendonitis (PTT), are common in active adults with high mobility demands and often stem from altered lower extremity mechanics, prolonged standing, and poor footwear. This case evaluates the outcomes of a multifaceted rehabilitation program for an active adult with PF and PTT.

Case Description: A 32-year-old female presenting with persistent right medial ankle pain following an inversion injury six months earlier, a history of chronic bilateral PF, right medial knee pain, and left sciatica. Pain was aggravated by prolonged walking and exercise. Examination revealed bilateral rearfoot and tarsal inversion/eversion hypermobility, deficits in ankle strength, medial ankle tenderness, altered gait mechanics, and a Lower Extremity Functional Scale (LEFS) score of 67/80.

Intervention: Early treatment focused on resisted ankle strengthening, stretching, and balance training and progressed to functional strengthening, plyometrics, and proprioceptive training. Kinesio taping supported arch function and movement awareness.

Outcomes: After seven weeks, the patient reported improved strength but continued symptoms with activity and reassessed. Modifications to her plan included proximal strengthening and footwear changes. Following a work-related break and home program for one month, she resumed therapy. Three months later her LEFS score was 72/80, a change of five points, but below the minimal detectable change (MDC) and minimal clinically important difference (MCID) of nine points.

Conclusion: This case underscores the value of individualized treatment interventions addressing proximal and distal impairments and footwear contributors to chronic ankle dysfunction, with ongoing reassessment.

Keywords: plantar fasciitis, posterior tibialis tendonitis, ankle sprain, rehabilitation

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Rehabilitation of Bilateral Quadriceps Tendon Strain in a Commercial Pilot: A Case Report on Non-operative Functional Recovery

Eric Satoshi Redona

Background and Purpose: Bilateral quadriceps tendon injuries are rare, especially in otherwise healthy individuals without systemic conditions such as diabetes, renal disease, or corticosteroid use. These injuries bring unique challenges due to the lack of an unaffected limb for compensation. The purpose of this case report is to highlight the clinical presentation and conservative rehabilitation of a 56-year-old male airline pilot who sustained a bilateral quadriceps tendon strain, emphasizing individualized care and functional goal-setting in a patient with physically demanding occupational requirements.

Case Description: The patient sustained bilateral quadriceps tendon strain (R > L) following a fall in October 2024. He presented to outpatient physical therapy 12 weeks post-injury with complaints of bilateral knee pain, quadriceps weakness, gait abnormalities, and difficulty with prolonged sitting, ambulation, and return to recreational activities. Objective findings included patella alta, right quadriceps atrophy, hypomobility of superior patellar glide, and a Lower Extremity Functional Scale (LEFS) score of 41/80. A rehabilitation program was designed to address strength, neuromuscular control, and functional limitations through progressive resistance training, proprioceptive exercises, and activity-specific interventions.

Outcomes: Over the course of care, the patient demonstrated improved quadriceps strength, enhanced knee stability, and reduced gait compensations. He progressed from isometric to eccentric strengthening and demonstrated improved tolerance for prolonged sitting and walking. Functional gains included increased confidence in stair navigation, sit-to-stand transfers after a long flight of prolonged sitting, and gradual reintroduction of weight-bearing recreational activities.

Discussion and Conclusion: This case illustrates the complexities of conservative rehabilitation for bilateral quadriceps tendon strain in an active adult without predisposing systemic conditions. The patient's occupation as an airline pilot added functional constraints that informed treatment planning. The individualized, progressive approach was effective in restoring function and reducing pain. This case contributes to the limited literature on non-operative management of bilateral quadriceps injuries and emphasizes the need for further research to guide clinical decision-making in similar presentations.

Key Words: bilateral quadriceps tendon strain, conservative rehabilitation, non-surgical management

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Physical Therapy Management of a Patient with Polytrauma in a Skilled Nursing Facility Post Motorcycle Accident

Diana Regalado

Background and Purpose: Motorcycle accidents often result in complex, multi-system injuries that require coordinated rehabilitation. This case study explores the challenges of physical therapy in a patient with bilateral non-weight-bearing restrictions following a motorcycle accident.

Case Description: Pt was a 67-year-old male admitted to a skilled nursing facility (SNF) after sustaining multiple injuries: subdural hematoma, thoracic spine fractures (T4–T6), pelvic, sacral and left ankle fractures, all requiring open reduction internal fixation (ORIF). His hospital course included complications such as sepsis and rebleeding of his subdural hematoma, delaying rehabilitation. At SNF admission, he was non-weight bearing in both lower extremities and significantly deconditioned. Therapy focused on mobility, safety, and functional recovery over a 27-day period which were limited by insurance constraints before transferring to another facility for continued rehabilitation.

Outcomes: Standardized functional testing was not feasible due to non-weight-bearing status. Instead, progress was measured through goal-based reassessments. The patient improved in bed and wheelchair mobility, transfers, and activity tolerance, demonstrating positive response to therapy despite physical and pain restrictions.

Discussion and Conclusions: Rehabilitating patients with polytrauma and bilateral non-weight-bearing restrictions presents significant challenges. This case demonstrates how tailored, seated-based interventions, interdisciplinary coordination, and engagement strategies like gamification can support meaningful functional gains despite mobility and pain-related barriers.

Key words: Polytrauma, motorcycle accident, physical therapy, non-weight bearing, rehabilitation, pain management, functional mobility, older adult, interdisciplinary care

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Exploring the Impact of Delayed Access to Physical Therapy and Misunderstanding of Weight-Bearing Protocols after Undergoing a Tibial Intramedullary Rod Insertion: a case study

Dassni Rodriguez

Background and Purpose: Although intramedullary (IM) nailing has become the standard method of treating tibial shaft fractures, there is no current universal weight-bearing protocol for tibial shaft fractures after IM nailing. Access to physical therapy and comprehensive healthcare is crucial after a tibial IM nail procedure. The purpose of this case study is to examine whether health care disparities and language barriers may impact post-surgical outcomes due to delayed access to physical therapy and misunderstanding of weight-bearing protocols.

Setting: Outpatient Orthopedic Physical Therapy Clinic.

Case Description: The patient was a 42-year-old, Spanish-speaking male who sustained a spiral tibial diaphysis fracture and oblique fracture of proximal fibula. He was treated with a tibial IM rod and remained non-weight bearing for 11 weeks prior to physical therapy intervention.

Outcomes: Improvements were observed in strength and Lower Extremity Functional Scale outcome measure by the time of discharge. He returned to working full time on light duty as a construction material distributor.

Discussion: Current literature suggests that weight bearing as tolerated after a tibial IM rod is generally safe and does not result in adverse outcomes. However, post-surgical protocols designed by MDs vary widely. Additionally, limited proficiency in English along with a lack of familiarization with physical therapy or the health care system can have negative consequences on post-surgical outcomes.

C**onclusion**: Skilled PT plays an important role in offering professional guidance on safe weight bearing progression. Furthermore, a licensed medical interpreter should be available for patients to assure understanding of protocols and medical advice.

Key Words: Tibial shaft fracture, fibula fracture, intramedullary nail, weight-bearing protocol, health care disparities

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Physical Therapy Management of a Patient with Chronic Achilles Tendinopathy and Proposed Strategy to Reduce Re-Injury

Dory Schneider

Background and Purpose: Achilles tendinopathy is a common injury caused by a singular event or repetitive stress to the tissue. It ranges in severity and can significantly impact an individual's ability to walk, run, and jump. Physical therapy and conservative management are supported treatment approaches in the literature. However, even with successful rehabilitation outcomes, the incidence of reoccurring Achilles tendinopathy is unclear. The purpose of this case report is to describe the physical therapy management of a patient with Achilles tendinopathy, and the potential impact of patient-specific lifestyle changes to optimize functional outcomes and reduce the risk of recurrence.
Case Description: The patient is a 55-year-old male with right Achilles pain, visible tendon thickening, and impaired ability to work and exercise. He had a history of two prior episodes in the past eight years, both managed with physical therapy. At initial evaluation, he presented with limited dorsiflexion (DF) ROM, limited plantar flexion (PF) strength, and inability to perform single leg stance on the affected side. A multimodal approach was implemented, including patient education, progressive loading with eccentric and plyometric exercises, and activity modification. Slowly integrating more functional activities as tolerance improved.
Outcomes: The patient reported improvement in pain and function. Objective improvements included increased ankle DF range of motion, greater PF strength, and tolerance of previously provocative activity.
Discussion and Conclusions: Patients may benefit from long-term strategies to promote tendon health to reduce the risk for re-injury. A proposed strategy to accomplish this is to incorporate habits early on that last beyond discharge and have structured progressions based on age matched normative values.
Key Words: Achilles Tendinopathy, Physical Therapy, Patient Education, Recurrence Prevention
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Physical Therapy Management of a Patient in a Skilled Nursing Facility status-post Multiple Abdominal Surgeries Presenting with Additional Comorbidities

Cameron Smith

Background and Purpose: Rehabilitation in skilled nursing facilities (SNF) requires managing the complex interplay between medical conditions and psychosocial factors that can limit participation in physical therapy. Older adults with multiple comorbidities often present with physical impairments compounded by cognitive or emotional barriers, such as fear-avoidance beliefs and self-limiting behavior. These factors can significantly reduce therapy engagement, delay recovery, and prolong institutional stays, ultimately leading to worse outcomes for individuals requiring post-acute care in sub-acute settings before returning to the community.

Case Description: The patient was a 74-year-old male admitted to a SNF following a prolonged hospital stay and multiple abdominal surgeries, including a sigmoid colectomy with Hartmann procedure. His recovery was complicated by hypotension, poor nutritional intake, RA-related pain, and a COVID-19 infection. Initial evaluation revealed impairments in strength, endurance, and balance, with limited functional mobility and ADL performance. Physical therapy included aerobic conditioning, functional mobility training, and cognitive-behavioral strategies such as motivational interviewing.

Outcomes: After six weeks of physical therapy, the patient demonstrated functional improvements, including increased independence with transfers and an improvement in 6-minute walk test from 92 to 182 feet. His Short Physical Performance Battery (SPPB) scores also improved, though participation was limited by fatigue, nausea, and pain. He was discharged home against medical advice prior to meeting all mobility goals.

Discussion and Conclusion: This case highlights the importance of a holistic, individualized rehabilitation approach that addresses both physical and psychosocial barriers. Integrating behavioral strategies and patient-centered goals into therapy is critical in promoting engagement and functional outcomes in medically complex patients.

Key words: Diverticulitis, Skilled Nursing Facility, Rheumatoid Arthritis, Physical Therapy, Participation and Engagement

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Physical Therapy Management of a Patient with Chronic Superficial Infrapatellar Bursitis: A Case Study

Cameron Stukel

Background and Purpose: Bursitis is the inflammation of bursae, fluid-filled pouches that reduce friction between tissues of the body, due to overuse, trauma, or infection. The purpose of this case study is to discuss the case of a 24-year-old male with chronic superficial infrapatellar bursitis and investigate the effectiveness of physical therapy intervention on pain and function.

Case Description: The patient is a 24-year-old male who presented direct-access to physical therapy with left anterior knee pain and palpable mass over the left patellar tendon. He was treated with conservative physical therapy techniques for 7 weeks including manual therapy, modalities, therapeutic exercise, neuromuscular re-education, and patient education.

Outcomes: The patient was able to walk and perform activities of daily living with 0/10 pain subjectively reported via the Numeric Pain Rating Scale (NPRS) following 7 weeks of conservative physical therapy treatment. He reported 6.5/10 pain with walking and performing ADLs upon initial evaluation. The Lower Extremity Functional Scale (LEFS) was used to track outcome. The patient scored 57 points initially, indicating a moderate functional limitation, but he was lost to follow-up and re-administration of LEFS did not occur. The patient met goals of being able to walk and navigate stairs with 0/10 pain reported via NPRS.

Discussion and Conclusion: There are few research studies that investigate the treatment of knee bursitis. This case report contributes to this knowledge gap by providing a detailed treatment approach and review of current evidence supporting the treatment of chronic superficial infrapatellar bursitis. It highlights the need for correct diagnosis of anterior knee pain and for further research to be done on the treatment of acute and chronic knee bursitis.

Key words: chronic bursitis, superficial infrapatellar bursitis, dry needling, instrument assisted soft-tissue mobilization, physical therapy

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Case Study: A Reflection on the Management of Lateral Medullary Syndrome in an individual who is deaf and blind from a Physical Therapy Perspective

Nathan Swanson-Dinsmore

Background and Purpose: Around 800,000 acute strokes occur in the United States per year. 60,000 or 7.5% of them present as lateral medullary syndrome (LMS). Risk factors include hypertension, diabetes, and smoking. The syndrome is due to the occlusion of the vestibular artery and/or posterior inferior cerebellar artery which leads to multiple impairments and deficits. People who are deafblind represent .0001% of the US population. People who are deaf and blind communicate with Tactile ASL or via braille to text keyboards, and palm writing. Due to the nature of their disability, they have decreased medical outcomes compared to people without disabilities. The purpose of this case study is to reflect on the PT management of an individual diagnosed with LMS in a patient who is deafblind.

Setting: Treatment was provided in a hospital in an urban area with sessions taking place with the patient's room and hallways of the hospital.

Case Description: The patient was a 59 y/o male who presented to the emergency room with elevated white blood cell count, blood urea nitrogen levels, and hyperglycemia and later diagnosed with dysphagia, aspiration pneumonia, and vocal cord paralysis secondary to LMS. The patient was a deafblind individual who communicates with Tactile ASL with comorbidities of diabetes mellitus, hypertension, and a history of a left middle cerebral artery stroke. During the initial evaluation key impairments found included decreased dynamic balance and coordination that affected the patient's ability to perform functional mobility such as ambulation and transfers independently. Due to the necessity of medical interpretation, objective information was difficult to collect at times. Interventions included task-specific practice of functional mobility, gait training, and a general exercise program to prevent pressure sores and maintain strength though were inconsistent due to other medical conditions present.

Outcomes: While the patient did not have a measurable difference in AM-PAC scoring, the patient had increases in ambulatory distances and quality of gait with use of front wheeled walker. Difficulties with Tactile ASL interpretation and decline in patient mentation led the patient to discharge earlier than expected, which negatively affected the anticipated outcomes.

Discussion and Conclusion: Difficulties in communication complicated this case. The employment of strategies for clinical staff to communicate with people who are deafblind when interpretation is not available is vital to improve outcomes in this population. When there are difficulties with communication, measurements of qualitative improvements provide valuable insight to evaluate progress. In addition, interdisciplinary collaboration and discussion are essential when managing LMS as the variety of the impairments requires management from different providers.

Key Words: Lateral Medullary Syndrome, Stroke, Deafblindness, Acute Care

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Using Translational Research to Guide Early Mobilization in a Heart Transplant Patient with Multisystem Impairments: A Case Report

Amber Tharp

Background and Purpose: Prolonged immobility in critically ill adults (CIAs) in the intensive care unit contributes to poor outcomes. Early mobilization (EM) can mitigate these effects, but guidance is limited for complex post-heart transplant (HT) cases. This case examines EM in a patient with multisystem impairments following HT.

Case Description: A 59-year-old male with minimal prior cardiac history was hospitalized for acute nonischemic heart failure requiring mechanical circulatory support, extracorporeal membrane oxygenation, and HT. Recovery was complicated by hemodynamic instability, peripheral nerve injury, sequelae of a left thalamic infarct, and sinus node dysfunction requiring a permanent pacemaker. Physical therapy emphasized functional mobility within orthopedic precautions, guided by patient response, hemodynamic monitoring, and consideration of cardiac denervation.

Outcomes: Despite ongoing neuromuscular deficits, the patient made significant gains in functional mobility, progressing from total dependence for all mobility to standby-contact guard assist for ambulation and stairs, enabling discharge home after a 99-day hospitalization.

Discussion: This case highlights the need for individualized, symptom-driven EM in medically complex patients. Therapists used real-time clinical reasoning and interdisciplinary collaboration to safely advance mobility in the absence of absolute contraindications to EM. Further research is needed to define EM criteria using central hemodynamic data applicable to more medically complex CIAs, and to determine the effects of EM on cardiac reinnervation in HT recipients.

Key Words: Early mobilization, heart transplant, physical therapy, cardiac rehabilitation, femoral nerve injury, hemodynamic instability, acute care

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The Impact of a Suspected Pre-existing Mood Disorder on Mild Traumatic Brain injury (mTBI) Recovery: A Case Report

Elijah Turner

Background and Purpose: Mild traumatic brain injury (mTBI), or concussion, is a common neurological injury resulting from falls, sports, or accidents. It typically causes temporary neurological dysfunction. The purpose of this case study is to explore how pre-existing mental health conditions influence mTBI recovery and contribute to communication challenges between clinicians and patients.
Setting: Treatment was provided at an outpatient, neurologic physical therapy clinic.
Case Description: The patient was a 27-year-old female (she/her) with a history of psychological disturbances requiring emergency department visits. She sustained an mTBI in a motor vehicle accident two weeks prior to beginning physical therapy. Reported symptoms included headaches, dizziness, neck pain, vision changes, emotional dysregulation, sleep disturbances, sensitivity to light/sound, and reduced endurance. Key impairments were limited cervical range of motion, impaired gaze stability, sleep issues, and emotional dysregulation. Interventions included visual habituation, relaxation strategies for sleep and anxiety, and pacing education to manage environmental stimulation.
Outcomes: The patient showed improvement in gaze stability and sleep quality. However, emotional symptoms persisted. A chart review at the end of the clinical rotation indicated the patient disclosed ongoing work/life challenges to another provider—concerns not shared during her final therapy session.
Discussion and Conclusion: Psychological factors can strongly impact mTBI recovery and communication gaps can lead to underreporting of issues and missed care opportunities. It is important to integrate psychological care in treatment as well as consider the day-to-day variability in self-reported symptoms for individuals with fluctuating mental health conditions in order to provide the best holistic care for patients with mTBI.
Key Words: mTBI, mental health, communication

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Physical Therapy Management of Medial Epicondylalgia: Blending Movement System Impairment and Tissue-Based Diagnoses

Emily Wilson

Background and Purpose: Medial epicondylalgia is an overuse condition primarily affecting the tendon originating from the common flexor-pronator mass. Pathoanatomically, it progresses through repetitive stress, leading to peritendinous inflammation, angiofibroblastic hyperplasia, and ultimately, structural breakdown, irreparable fibrosis, and calcification. Poor shoulder stability and movement patterns often contribute to an increased demand on elbow structures, which can precipitate and perpetuate medial elbow pathology. This study aims to illustrate the integration of the movement system approach with the pathoanatomical approach for diagnosing and treating medial epicondylalgia.
Setting: Treatment was provided at an outpatient orthopedic physical therapy clinic.
Case Description: The patient was a 35-year-old male with medial elbow pain that began about 3.5 months before seeking treatment. Key impairments included pain with movement, tenderness to palpation, and poor neuromuscular control of scapular stabilizers and scapulohumeral rhythm. Interventions included neuromuscular re-education focusing on scapulohumeral kinematics; progressive strengthening of scapular stabilizers, wrist pronators, and grip; intramuscular needling with electrical stimulation, and patient education emphasizing symptom-guided progression and adherence to the home exercise program.
Outcomes: Although the QuickDASH did not show a significant decrease in score, the patient made progress toward achieving his functional goals and returned to his previous level of function.
Discussion and Conclusion: Given the patient's low initial QuickDASH score, ceiling effects may have contributed to the patient's statistically insignificant changes in this score. Addressing movement patterns and proximal control was essential to the patient's progression and supported the pathoanatomical diagnosis.
Key Words: medial epicondylalgia, orthopedics, physical therapy

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Pulmonary Rehabilitation for Patients with Progressive Chronic Pulmonary Disease Awaiting Transplant in the Inpatient Setting: A Case Report

Jenna Yee

Background and Purpose: Patients with chronic pulmonary diseases awaiting lung transplants face unique challenges that can impact their transplant eligibility and therefore the course of their medical care, including physical therapy. This case study's purpose was to analyze the effectiveness of physical therapy, especially Pulmonary Rehabilitation (PR), at managing functional impairments for a patient with progressive, chronic lung conditions in hopes of achieving hospital discharge and meeting lung transplant criteria while highlighting the benefits of early and consistent interventions and examining the challenges of a prolonged hospital stay.

Setting: Inpatient treatment was provided through the physical therapy department at an urban hospital.

Case Description: The patient was a 62-year-old male with past medical history of multiple chronic lung conditions, type 2 diabetes mellitus, hypertension, anxiety, and low BMI who presented to the emergency department with hypoxia and dyspnea and was diagnosed with acute hypoxic respiratory failure. Key impairments included deficits in balance, safety awareness, endurance, and strength. Interventions focused on pulmonary rehabilitation, including pacing, fatigue and safety awareness, breathing techniques, strengthening, and gait, transfer, and assistive device training as well as patient education.

Outcomes: The patient demonstrated significant improvements with gait speed, but only non-significant improvements in additional outcome measures. However, his lung conditions progressed which complicated interventions and led to his transition to comfort care without PT services.

Discussion and Conclusion: Multiple factors may have impacted this patient's outcomes, including environmental and insurance limitations, increasing medical complexity, additional debilitating medical procedures, and the patient's reduced resiliency. Despite these limitations, the present case study indicates a potential benefit of PR and a role for physical therapy for patients with progressive, chronic lung conditions awaiting transplant.

Key Words: pulmonary rehabilitation, end-stage chronic lung disease, disease progression, inpatient rehabilitation

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Physical Therapy Management of a Lumbopelvic Pain in a Pregnant Woman

Connie Zhang

Background and Purpose: Lumbopelvic pain is the most common musculoskeletal related complaint from pregnant women, with approximately 68.5% of pregnant women reporting lumbopelvic pain throughout their pregnancy. Pregnancy brings about a significant amount of physiological, anatomical, and hormonal changes in a woman's body, contributing to lumbopelvic pain during pregnancy. These changes have direct implications for the nervous system, which must adapt to maintain balance, coordination, and overall body function. The purpose of this case study was to describe a patient who was referred to physical therapy in early pregnancy for treatment of lumbosacral pain. This case study presents the physical therapy examination findings and associated interventions. Outcomes will be presented, discussed, and compared to the current literature recommendations.

Setting: Treatment was provided at an outpatient, orthopedic physical therapy clinic.

Case Description: The patient was a 39-year-old female who presented to physical therapy at 17 weeks into her first pregnancy, with complaints of lumbopelvic pain that started approximately 1 month. She reported history of low back pain in 2023 that was successfully managed with physical therapy. Primary impairments include poor muscle performance of hip and core musculature, insufficient self-bracing including difficulty with activation of TA muscle, poor posture including increased lumbar lordosis, and poor single leg stability, and decreased muscle length and flexibility with hamstring and hip flexors. Interventions included strengthening and activation of hip and deep core musculature for neuromuscular learning, postural training, body mechanics training, as well as education on activity and lifestyle modification including sleeping positions and use of a lumbar support belt with activity.

Outcomes: The patient reported improvement in pain symptoms and demonstrated improved ability to activate transverse abdominis muscles with functional activities.

Discussion and Conclusion: Several factors may have limited the outcomes of this study, including the limited duration of the study allowing for only 5 visits, and the use of general orthopedic physical therapists instead of therapists specializing in women's health. Further research is needed to determine the optimal treatment approach for pregnant women with lumbopelvic pain.

Key Words: women's health, pregnancy, lumbopelvic pain, orthopedics