SCIENTIFIC
PROGRAM

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GLOBAL CONFERENCE ON PHYSIOTHERAPY, PHYSICAL REHABILITATION & SPORTS MEDICINE

ACCREDITED PROVIDER #778533

November 13-14, 2025
Lisbon, Portugal

PHYSIO-2025
Nov 13-14, 2025 | Lisbon, Portugal

ISBN: 978-1-917892-27-8

Day 1

THURSDAY

Global Conference on Physiotherapy, Physical Rehabilitation & Sports Medicine

November 13-14, 2025 | Lisbon, Portugal

Registrations & Opening Remarks (09:00-10:00)

Keynote Presentation (10:00 - 11:00)

10:00-10:30 -----

Title: Lumbosacral zone features in individuals with nonspecific low back pain are unique compared to controls and correlate with pain and dysfunction

Prof. Masharawi Youssef, Physical Therapy Department, The Stanley Steyer School of Health Profession, Gray Faculty of Medical and Health Sciences, Tel Aviv University, Israel

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10:30-11:00 -----

Title: Microglial Cells and Their Role in Neuropathic Pain: A Review

Dr. Miltiades Y Karavis, President of Hellenic Medical Acupuncture Society - Pain specialist, Greece

REFRESHMENT BREAK & GROUP PHOTO (11:00-11:20)

Technical Session-I (11:20 - 13:00)

11:20-11:45 -----

Title: Mental Fatigue in Patients with Hearing Loss and/or Tinnitus Undergoing Audiological Rehabilitation – A Pilot Study

Prof. Sten Hellstrom, Karolinska Institute, Sweden

11:45-12:10 -----

Title: Cellular Senescence in Metabolic Syndrome–Associated Osteoarthritis

Prof. Mei Wan, Johns Hopkins University, United States

12:10-12:35 -----

Title: Prolonged incubation time unwarranted for acute periprosthetic joint infections

Dr. Elizabeth Morreel, Maastricht UMC+, Netherlands

12:35-13:00 -----

Title: STMIPO Technique in the Treatment of Diaphyseal and Distal Tibial Fractures: A Retrospective Study of 57 Patients

Dr. Quankui Zhuang, No 2 people's hospital of Fuyang city, China

Lunch @ Restaurant (13:00- 14:00)

Technical Session- II (14:00-16:05)

14:00-14:25 -----

Title: Change in the activity of the upper and lower esophageal sphincter during changes in respiratory and postural conditions

Dr. Petr Bitnar, Charles University Prague, Czech Republic

14:25-14:50 -----

Title: The role of self-management in the training of mobility after stroke: a pilot study

Dr. Ahmad-Sahely, Jazan University, Saudi Arabia

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14:50-15:15 -----

Title: Association between the rs820218 Variant within the SAP30BP Gene and Rotator Cuff Rupture in an Amazonian Population

Dr. Rui Sergio Monteiro de Barros, State University of Pará, Brazil

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15:15-15:40 -----

Title: Innovative Application of the LIC TRAINER for Respiratory Rehabilitation in Neuromuscular Disorders

Dr. Hiroyasu Inoue, Showa Medical University, Japan

15:40-16:05 -----

Title: Exercise can show its antidepressant effects through kisspeptin

Prof. Haluk Kelestimur, Istanbul Okan University, Turkey

REFRESHMENT BREAK (16:05-16:25)

16:25-16:50 -----

Title: Using virtual reality in physiotherapy for women with urinary incontinence

Dr. Gabriela Kolodynska, Wroclaw University of Health and Sport Sciences, Poland

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16:50-17:15 -----

Title: Aetiopathogenesis of Rotator Cuff Tear in Patients Younger than 50 Years: Medical Conditions Play a Relevant Role

Prof. Vincenzo Campagna, Military Hospital of Rome, Italy

17:15-17:40 -----

Title: Treatment of Osteoporotic Vertebral Fractures: Diagnostic and Therapeutic Considerations

Dr. Dario Kalacun, General and Teaching Hospital Celje, Slovenia

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17:40-18:05 -----

Title: Microbiome features associated with performance in an athletic cohort and nonathletic controls

Dr. Kinga Humińska-Lisowska, Gdansk University of Physical Education and Sport, Poland

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18:05-18:30 -----

Title: Comparative Effectiveness of Artificial Intelligence–Assisted 3D Printed Customized Knee Brace and Exercise Therapy Versus Conventional Electrotherapy in Ergonomical Knee Pain: A Randomized Controlled Study

Prof. S Purna Chandra Shekhar, MNR University, India

Pannel Discussions

Day-1 Concludes

Day 2

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Technical Session- I (10:00-12:50)

10:00-10:25 -----	**Title: How Should We Measure Inter-Recti Distance Using Ultrasound Imaging? Findings from a Scoping Review and Recommendations for Practice** **Prof. Agnieszka Opala-Berdzik,** Academy of Physical Education in Katowice, Poland
10:25-10:50 -----	**Title: Investigating the experience of people with oral difficulties as a result of peripheral facial palsy** **Mrs. Rebecca Kimber,** University College Hospital London (NHS), United Kingdom

REFRESHMENT BREAK & GROUP PHOTO (10:50-11:10)

11:10-11:35 -----	**Title: Applicability of an unstable platform integrated with virtual reality in the rehabilitation of postural control** **Mr. Dalton Kina,** University of Saeo Paulo School of Medicine, Brazil
11:35-12:00 -----	**Title: Recovery from Exercise in Persons with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)** **Prof. Betsy Keller,** PaceForward Foundation, Ithaca College, United States
12:00-12:25 -----	**Title: Comparison of Clinical and Functional Outcomes in Patients Operated with Standard Offset Stem versus High Offset Stem in Total Hip Replacement: A Retrospective Study** **Dr. Siddharth Rajendra Gunay,** Clinical Fellow in Arthroplasty & Sports Medicine, India
12:25-12:50 -----	**Title: Relationship between lean body mass and motor function in ambulant patients with Duchenne muscular dystrophy** **Dr. Agnieszka Sobierajska-Rek,** Medical University of Gdansk, Poland

Lunch @ Restaurant (12:50-13:50)

Poster Presentation (13:50-14:15)

P1 -----	**Title: No Effect of Shockwave and Ultrasound Therapy on Jump Performance and Kinesthetic Differentiation Ability in Patients with Achilles Tendinopathy:A Pilot Study** **Dr. Magdalena Stania,** Academy of Physical Education in Katowice, Poland

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P2 -----	**Title: Pathological Classification of Idiopathic Carpal Tunnel Syndrome Based on Transthyretin Amyloid Deposition in the Synovium** **Dr. Yoshiaki Yamanaka,** University of Occupational and Environmental Health, Japan
P3 -----	**Title: Tuberculous Osteomyelitis of the Coracoid Process Presenting as Shoulder Pain: A Case Report** **Dr. Siddharth Rajendra Gunay,** Clinical Fellow in Arthroplasty & Sports Medicine, India

Technical Session- II (14:15-17:30)

14:15-14:40 -----	**Title: Reliability and Validity of the Lowenstein Communication Scale** **Ms. Orin Yardeni,** Loewenstein Rehabilitation Medical Center, Israel
14:40-15:05 -----	**Title: Progress in Dentin-Derived Bone Graft Materials: A New Xenogeneic Dentin-Derived Material with Retained Organic Component Allows for Broader and Easier Application"** **Dr. Lari Sapoznikov,** Private Clinic in Tel Aviv, Israel
15:05-15:30 -----	**Title: Standardizing Clerking Practice: An Orthopaedic Audit of Hip Fracture Proforma Compliance** **Dr. Saarah Talha,** Royal Shrewsbury Hospital, United Kingdom
15:30-15:55 -----	**Title: A Different Type of Tennis Elbow: Spontaneous Septic Arthritis of the Elbow in a Previously Heathy 40-Year-Old Male** **Dr. Adriana M. Mercado Rodríguez,** Ponce Health Sciences University, Puerto-Rico

Refreshment Break (15:55-16:15)

16:15-16:40 -----	**Title: Ultrasound Shear Wave Elastography to Assess Adult Skeletal Muscles** **Prof. Jing Gao,** Rocky Vista University, USA
16:40-17:05 -----	**Title: Effect of Elastic Resistance on Scapular Kinematics During Overhead Squats: Implications for Shoulder Stability and Rehabilitation** **Mr. Fagner Luiz Pacheco Salles,** University of Lisbon, Portugal
17:05-17:30 -----	**Title: Fostering Person-Centred Care in Physiotherapy Rehabilitation Practice** **Prof. Margarida Santos,** School of Health and Technology, Polytechnic Institute of Lisbon, Portugal

Closing remarks

Day-2 Concludes

Parallel Virtual Scientific Program

November - 14, 2025

09:50AM CET Time

Join Zoom Meeting

Meeting ID: 826 8754 9103

Passcode: Urf@2025

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09:50-10:00 ----- (E-Poster)	**Title: Quantitative Evaluation of Surface Electromyography on Upper Limb Dystonia after Stroke** **Dr. Fan Jiang,** Department of Neurology, Shapingba Hospital affiliated to Chongqing University(Shapingba District People's Hospital of Chongqing), Chongqing, 400030, China
10:00-10:25 -----	**Title: Effectiveness of Home-Based Circuit Training on Body Mass Index, Biochemical Parameters, and Musculoskeletal Fitness in Overweight or Obese Adults with Knee Osteoarthritis and Type 2 Diabetes Mellitus** **Dr. Wan Syaheedah Wan Ghazali,** Universiti Sains Malaysia, Malaysia
10:25-10:50 -----	**Title: LUtarjet- Limit Unique Coracoid Osteotomy Suture Button Latarjet** **Prof. Wei Lu,** Shenzhen Hospital of Southern Medical University, China
10:50-11:15 -----	**Title: Primary Aneurysmal Bone Cyst of Sacrum: A Case Report of a 12 years old boy from Pakistan** **Dr. Arham Amir Khawaja,** Shaikh Zayed Medical Complex lahore, Punjab, Pakistan
11:15-11:40 -----	**Title: The effectiveness of radial shockwave therapy on myofascial pain syndrome: a two-armed, randomized double-blind placebo-controlled trial** **Dr. Collins Ogbeivor,** King Faisal Specialist Hospital, Saudi Arabia
11:40-12:05 -----	**Title: The effect of game-based intervention on locomotor skills of female students aged 9–11 years with flat foot** **Dr. Ebrahim Ebrahimi,** University of Tehran, Iran
12:05-12:30 -----	**Title: Potential Use of a New Energy Vision (NEV) Camera for Diagnostic Support of Carpal Tunnel Syndrome: Development of a Decision-Making Algorithm to Differentiate Carpal Tunnel-Affected Hands from Controls** **Dr. Hamza Murad,** Rabin medical center, Israel
12:30-12:55 -----	**Title: Effects of perceptive rehabilitation and mobilization methods on symptoms and disability in patients with fibromyalgia: A Randomized Controlled Trial** **Dr. Beraat Alptug,** European University of Lefke, Turkery
12:55-13:20 -----	**Title: Effect of Pulmonary Rehabilitation and Inspiratory Muscle Training on Patients With Unilateral Diaphragmatic Eventration** **Dr. Amal Albatini,** Universidad de CÃ¡diz, Kuwait

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13:20-13:45 -----	**Title: Implementation of digital technology in the service of health protection for long-term care users** **Dr. Ivana Crnković,** University of Applied Health Sciences, Croatia
13:45-14:10 -----	**Title: Inclusive Tourism as a Form of Physical Activity and Rehabilitation: Accessibility of Main Tourist Attractions in the Świętokrzyskie Region, Poland** **Ms. Klaudia Chwaja,** University of Culture Physical in Kraków, Poland
14:10-14:35 -----	**Title: Burden of Knee Osteoarthritis in South Asia, 1990–2021: Findings from the Global Burden of Disease Study** **Dr. Muhammad Tayyab,** Bradford Teaching Hospitals NHS Trust, United Kingdom
14:35-15:00 -----	**Title: Raising the Standard: Improving Surgical Risk Documentation in Trauma and Orthopaedics** **Mr. Benjamin Smith,** Royal Shrewsbury Hospital, United Kingdom
15:00-15:25 -----	**Title: First Case of Calcaneal Brodie's Abscess Caused by Fusobacterium Nucleatum in an Immunocompetent Adult** **Dr. Zain Al Abdeen Al Zuabi,** Paradise house, United Kingdom
15:25-15:50 -----	**Title: Comparison of outcomes between resurfaced and unresurfaced patella in total knee arthroplasty using medial congruent liners: a retrospective study** **Dr. Johannes Van Der Merwe,** University of Saskatchewan, Canada
15:50-16:15 -----	**Title: RNase L represses hair follicle regeneration through altered innate immune signaling** **Dr. Sashank Reddy,** Johns Hopkins University, United States
16:15-16:40 -----	**Title: Patellofemoral Pain: Hip Muscle Activation and Kinematics with Exercise and External Support** **Dr. David M. Selkowitz,** MGH Institute of Health Professions, United States
16:40-17:05 -----	**Title: Transdermal Delivery of Botulinum Neurotoxin A: A Novel Formulation with Therapeutic Potential** **Dr. Raj Kumar,** Institute of Advanced Sciences, United States

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17:05-17:30 -----	**Title: Tear Area Predicts Natural History of Rotator Cuff Degeneration: A Retrospective Study of Supraspinatus Tear Progression** **Prof. Ara Nazarian,** BIDMC, HMS, United States
17:30-17:55 -----	**Title: The Pharmacists of Physical Activity: Physiotherapists and the provision of practical strategies to meet and exceed worldwide standards** **Dr. Mike Studer,** Touro University Nevada, United States
17:55-18:20 -----	**Title: Neuromodulation in multi-functional rehabilitation for patients with spinal cord injury** **Prof. Alexander Ovechkin,** University of Louisville, United States

Closing remarks

Day-2 Concludes

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Prof. Youssef Masharawi, Ph.D. Asaf Weisman, Ph.C., Nathan Peled, M.D., Haytam Kasem, Ph.D., Gali Dar. Ph.D

Physical Therapy Department, The Stanley Steyer School of Health Profession, Gray Faculty of Medical and Health Sciences, Tel Aviv University, Israel

Lumbosacral zone features in individuals with nonspecific low back pain are unique compared to controls and correlate with pain and dysfunction

Abstract: The study aimed to compare the lumbosacral nerve distances (LNDs) and sacroiliac joint (SIJ) morphology in individuals with nonspecific chronic low back pain (NSCLBP) and controls and examine their correlations with pain and dysfunction. The sample included 200 young adult patients (ranging from 20-50 years old) referred for abdominal computerized tomography (CT):100 individuals with NSCLBP (50 males and 50 females) and 100 individuals without NSCLBP (50 males and 50 females). CT scans were assessed for LNDs, degenerative sacroiliac changes, and joint bridging. Those factors were correlated to the outcomes of three self-reported questionnaires about pain and function (Oswestry, Fear avoidance and Numerical Pain Rating Scale). The results indicated that Individuals with NSCLBP tend to have reduced LNDs from the sacral part of the SIJ compared to controls (Males: right - Δ = 5.8 mm, left - Δ =6.03mm; Females: right – Δ = 7.9 mm, left - Δ = 7.73mm, ANOVA- $p<0.01$), with moderate significant negative correlations with all three questionnaires ($-0.38<$Pearson's $r<-0.57$, $p<0.02$, i.e., reduced LNDs with greater disability and pain). The NSCLBP group had more significant SIJ degeneration severity that moderately correlated with two questionnaires ($0.39<$Pearson's $r<0.66$, $p<0.04$, i.e., greater SIJ degeneration with greater disability and pain). In males, existence of SIJ bridging strongly correlated with all three questionnaires ($0.38<$Pearson's $r<0.78$, $p<0.03$) and in females only the Fear-Avoidance questionnaire and Numerical Pain Scale ($0.29<$Pearson's $r<0.41$, $p<0.04$). In conclusion, compared to controls, individuals with NSCLBP have reduced LNDs and worse SIJ degenerative changes that correlate with function and Pain.

Biography: Professor Youssef Masharawi is an Associate Professor in the Department of Physical Therapy at Tel Aviv University. A licensed physiotherapist, he specializes in spinal disorders, integrating manual therapy, biomechanics, and rehabilitation science. He holds a Ph.D. in Anatomy and Anthropology from Tel Aviv University and completed postdoctoral research in Denmark. He leads the Spinal Research Laboratory, focusing on clinical, functional, and epidemiological aspects of spinal health. Professor Masharawi has published extensively, teaches undergraduate and graduate courses, and mentors research students. He also promotes diversity as head of the Arab Integration Committee at Tel Aviv University and is active in international spine research societies.

doi.org/10.51219/URForum.2025.Youssef-Masharawi ISBN: 978-1-917892-27-8

Prof. Sten Hellström

Senior Professor, Division of Ear, Nose and Throat Disease, Karolinska Institutet Stockholm, Sweden

Mental Fatigue in Patients with Hearing Loss and/or Tinnitus Undergoing Audiological Rehabilitation – A Pilot Study

Abstract: Mental fatigue or fatigue is a complex, subjective phenomenon often described as “an early exhaustion after physical or mental activity” related to e.g. loss of energy, sleep deprivation and fatigability. Mental fatigue is common after chronic health conditions, such as brain injury and neurological diseases. Hearing loss and tinnitus are two conditions affecting physical functioning, vitality and mental health, which may lead to mental fatigue. In the present study we identified and determined the degree of fatigue in patients with hearing loss and/or tinnitus undergoing advanced audiological rehabilitation at our department. Data on 76 consecutive patients were examined by the self-reported Mental Fatigue Scale (MFS) and analysed. The patients were subjected to hearting tests and Tinnitus Handicap Inventory (THI). The age-range of the study population were 38-65 years and most had normal hearing (37%) or mild-to-moderate hearing loss (46%). !7% had severe-to profound hearing loss. A total of 56.5% had tinnitus, of which 39.5% scored £57 on the THI. 67% of the participants had severe MSF scores £20.5. Most of the patients with a THI score £57 belonged to that group. It appears that severe mental fatigue is more common in patients with severe tinnitus than sole hearing loss.

Biography: Sten Hellström (SH) is a senior professor in Otorhinolaryngology (ORL) at Karolinska Institutet (KI). Before retirement he was senior consultant and chief of the Dept of Audiology and Neurotology at Karolinska Univ Hospital. SH started his career at Umeå University the most Northern university of Sweden. Here he was the professor of ORL and CMO of the hospital during several years before moving to Stockholm. He was chairman of Acta Oto-Laryngologica Foundation during 20 years. At KI he is general secretary for Center for Hearing and Communication Research and was one of the initiators of Scientific Center for Advanced Pediatric Audiology. His research has mainly focused on middle ear but more recently on inner ear and hearing rehabilitation. He is an world expert in the field of otitis media and has published more than 300 papers. He has a broad network of international scientists.

doi.org/10.51219/URForum.2025.Sten-Hellstrom ISBN: 978-1-917892-27-8

Petr Bitnar, Charles University Prague, Clinic of rehabilitation and sports medicine, Prague, Czech Republic

Co-authors: Lucie Zdrhová, Charles University, Faculty of medicine, Plzeň, Clinic of gastroenterology, Plzeň, Czech republic
Alena Kobesová, Charles University Prague, Clinic of rehabilitation and sports medicine, Prague, Czech Republic

Change in the activity of the upper and lower esophageal sphincter during changes in respiratory and postural conditions

Abstratct:

Background
The upper and lower esophageal sphincter are essential units of the gastrointestinal ract. The upper esophageal sphincter (UES) is formed from the cricopharyngeus muscle and in the area of the lower esophageal sphincter (LES) it is the diaphragm.

Question: Is it possible that the functions of the esophageal sphincters can affect the disorders and functions of the motor system?

Purpose: Is it possible to influence and treat dysfunctions of these sphincters with rehabilitation methods and techniques other than diaphragmatic breathing?

Method: The group of 62 patients (20-77 years). Patients were subjected to a functional esophageal examination using High resolution manometry.

Sphincter activity was measured during: triple flexion of the lower extremities, manual stabilization of the chest and traction of the cervical spine.

Results: During triple flexion of the lower limbs above the mat during simultaneous manometric probing, there is a significant increase in pressure in both esophageal sphincters. During manual caudalization of the chest, there is a decrease in tone in the area of the UES and an increase in pressure in the area of the LES. During manual therapeutic traction of the cervical spine, there is a significant decrease in the UES area and a statistically significant increase in pressure in the LES area.

Summary: The results show that the change in postural and respiratory conditions leads to significant changes in the area of both esophageal sphincters.Given the significant influence of these rehabilitation techniques, it is possible to postulate that rehabilitation can lead to the treatment of some functional disorders of the GIT.

doi.org/10.51219/URForum.2025.Petr-Bitnar ISBN: 978-1-917892-27-8

Biography:

Dr. Petr Bitnar is an experienced physiotherapist and academic specializing in rehabilitation, kinesiology, and the interplay between respiration, posture, and esophageal function. He earned his master's degree in Physiotherapy from Charles University, Prague, in 2007. He later completed a doctoral degree in Kinanthropology in 2018, followed by a PhD in Rehabilitation and Kinesiology in 2022. His dissertation focused on "Respiration and posture influence on the activity of upper and lower esophageal sphincters."

Since 2007, Dr. Bitnar has served as a specialist physiotherapist at University Hospital Motol in Prague and has been an active educator at the Faculty of Medicine, Clinic of Rehabilitation and Sports Medicine.

Since 2009, he has also worked as an international lecturer, delivering physiotherapy training courses worldwide, including in the USA, Taiwan, Australia, Chile, India, South Korea, and other countries. His teaching topics include myofascial pain syndrome, viscerosomatic relationships, and viscerofascial manipulation.

doi.org/10.51219/URForum.2025.Petr-Bitnar ISBN: 978-1-917892-27-8

Dr. Ahmad-Sahely

Jazan University, Saudi Arabia

The role of self-management in the training of mobility after stroke: a pilot study

Abstract:

Objective: To evaluate the feasibility of implementing a self-management intervention to improve mobility in the community for stroke survivors.

Methods: A two-phase sequential mixed methods design was used (a pilot randomised controlled trial and focus groups). Participants were adult stroke survivors within six months post discharge from hospital with functional and cognitive capacity for self-management. The intervention included education sessions, goal setting and action planning, group sessions, selfmonitoring and follow up. The control group received usual care and both groups enrolled for 3 months in the study. Feasibility outcomes (recruitment and retention rates, randomisation and blinding, adherence to the intervention, collection of outcome measures, and the fidelity and acceptability of the intervention). Participants assessed at baseline, 3 months and 6 months for
functional mobility and walking, self-efficacy, goal attainment, cognitive ability, and general health. A descriptive analysis was done for quantitative data and content analysis for the qualitative data. Findings of quantitative and qualitative data were integrated to present the final results of the study.

Results: Twenty-four participants were recruited and randomised into two groups (12 each). It was feasible to recruit from hospital and community and to deliver the intervention remotely. Randomisation and blinding were successful. Participants were retained (83%) at 3 months and (79.2%) at 6 months assessments. Adherence to the intervention varied due to multiple factors. Focus groups discussed participants' motivations for joining the programme, their perspectives on the intervention (fidelity and acceptability) and methodology, perceived improvements in mobility, facilitators and challenges for self-management, and suggestions for improvement.

Conclusion: The self-management intervention seems feasible for implementation for stroke survivors in the community. Participants appreciated the support provided and perceived improvement in their mobility. The study was not powered enough to draw a conclusion about the efficacy of the program and a future full-scale study is warranted.

doi.org/10.51219/URForum.2025.Ahmad-Sahely ISBN: 978-1-917892-27-8

Biography: Dr. Ahmad Sahely, DPT, PhD, is a dedicated physiotherapist and academic at Jazan University, Saudi Arabia. He earned his Doctor of Physical Therapy and completed a PhD focused on advanced rehabilitation techniques. At Jazan University's College of Applied Medical Sciences, he combines clinical expertise with academic excellence as a specialist in musculoskeletal and neuromuscular rehabilitation. Dr. Sahely has led numerous initiatives to enhance physiotherapy education and practice, integrating evidence-based interventions in both classroom and clinical settings. He serves on several institutional committees, contributing to curriculum development, academic accreditation, and clinical research oversight. An active researcher, Dr. Sahely's work explores innovative approaches to improving patient outcomes through targeted exercise protocols, postural correction, and manual therapy. He regularly presents at national and regional conferences and has published in peer-reviewed physiotherapy journals. Passionate about mentoring, he supervises graduate students and supports collaborative research projects aimed at advancing rehabilitation science in the Kingdom and beyond.

doi.org/10.51219/URForum.2025.Ahmad-Sahely ISBN: 978-1-917892-27-8

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[2]Division of Occupational Therapy, Department of Rehabilitation, School of Nursing and Rehabilitation Sciences, Showa Medical University, Yokohama, Kanagawa, Japan

[3]Department of Clinical Engineering, Showa Medical University Fujigaoka Hospital, Yokohama, Kanagawa, Japan

[4]Department of Neurology, Showa Medical University Fujigaoka Hospital, Yokohama, Kanagawa, Japan

Innovative Application of the LIC TRAINER for Respiratory Rehabilitation in Neuromuscular Disorders

Abstract: The LIC TRAINER is a respiratory rehabilitation device developed in Japan for patients with neuromuscular diseases such as amyotrophic lateral sclerosis. In this report, we present a clinical demonstration of modified lung volume recruitment (mLVR) therapy using the LIC TRAINER, showcasing its practical application in respiratory rehabilitation. A 60-year-old man with anti-mitochondrial M2 antibody-positive myositis experienced progressive proximal muscle weakness, dyspnea, and CO_2 narcosis. Despite corticosteroid treatment, respiratory failure worsened, necessitating tracheostomy and mechanical ventilation. Given the limitations of conventional lung volume recruitment in patients with impaired respiratory muscle strength and tracheostomy, mLVR therapy was introduced using the LIC TRAINER. A physiotherapist administered insufflations via bag-valve mask, starting at 1500 mL and gradually increasing to 2500 mL, while monitoring airway pressure and patient comfort. A structured demonstration protocol was used to adjust volume and pressure safely. Respiratory function was assessed through thoracic expansion, inspiratory capacity, vital capacity, tidal volume, and visual analogue scale. Substantial improvements were noted in both objective respiratory parameters and subjective comfort. The patient was successfully weaned off the ventilator after 48 days and resumed oral feeding by day 56 without complications. This clinical demonstration underscores the effectiveness and adaptability of LIC TRAINER-based mLVR therapy as a respiratory rehabilitation option for neuromuscular respiratory failure.

doi.org/10.51219/URForum.2025.Hiroyasu-Inoue ISBN: 978-1-917892-27-8

It offers individualized, safe, and scalable therapy even in patients with complex airway management. These findings support further investigation of mLVR using the LIC TRAINER in broader clinical settings to supplement pharmacologic approaches in inflammatory myopathies.

Keywords: autoimmune myositis, lung volume recruitment, respiratory failure, respiratory muscle weakness, tracheostomy, respiratory rehabilitation

Biography: Dr. Hiroyasu Inoue is an Associate Professor in Physical Therapy at Showa Medical University and Section Chief of Rehabilitation at Showa Medical University Fujigaoka Hospital. He earned his Ph.D. in Health Sciences in 2019. He specializes in critical care rehabilitation, dysphagia management, and early mobilization in the ICU. He holds certifications in stroke, dysphagia, respiratory, and intensive care physical therapy. His research focuses on ICU rehabilitation, swallowing ultrasound, and post-extubation pneumonia. He contributes to clinical guidelines and presents widely at academic congresses.

doi.org/10.51219/URForum.2025.Hiroyasu-Inoue ISBN: 978-1-917892-27-8

Haluk Kelestimur[1], Emine Kacar[2], Ihsan Serhatlioglu[2]

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Exercise can show its antidepressant effects through kisspeptin

Abstract: Exercise has positive effects on the brain; therefore, it has emerged as a promising therapeutic option for individuals with depression. Although considerable research involving humans and animals offers compelling evidence to support the mental health benefits of physical activity, the mechanism by which exercise shows its antidepressant effects remain to be cleared. Kisspeptins are reported to be the most potent activators of the hypothalamus-pituitary-gonadal (HPG) axis known to date. Kisspeptin potently elicits gonadotropin-releasing hormone (GnRH) release and luteinizing hormone (LH) secretion, even in the pre-pubertal period. Beyond the hypothalamus, kisspeptin is also expressed in limbic and paralimbic brain regions, which are areas of the neurobiological network primarily implicated in emotional behaviors alongside sexual functions. Therefore, an increasing body of studies has implicated kisspeptin as having many influences on emotional behaviors. Our previous study showed that the treadmill exercise caused a significant increase in the in kisspeptin and kiss1R gene expression. The study was set out to explore if the kisspeptin/GPR54 signaling system is required for the anti-depressant-like effect of kisspeptin-10 (KP-10), besides the regulation of the HPG axis. To test this concept, peptide 234 (P234), a kisspeptin antagonist, was given to the male rats, and its modulatory effect on the anti-depressant-like effects of kisspeptin was investigated by using a forced swimming test (FST). The study has also sought to know whether kisspeptin can exert its effects through adrenergic and serotonergic receptors. Our data also demonstrate that the anti depressant-like effects of kisspeptin, at least in part, are mediated by an interaction of the alpha-2 adrenergic and 5-HT2 serotonergic receptors.

Keywords: Exercise, kisspeptin, antidepressant effect

Biography: Dr Haluk Kelestimur is a Professor of Physiology in Istanbul Okan University. He gained his PhD in Physiology in 1984 from the University of Firat, Turkey. He then completed his postdoctoral training at University College London in 1988. After he worked 42 years in Firat University, he began to work in Istanbul Okan University in 2022. His work focusses on neuroendocrinology. She has published more than 80 research articles in SCI (E) journals.

Professor Haluk Kelestimur was elected to membership in the International Union of Physiological Sciences Academy in 2021.

doi.org/10.51219/URForum.2025.Haluk-Kelestimur ISBN: 978-1-917892-27-8

Gabriela Kołodyńska[1*] , Maciej Zalewski[2], Aleksandra Piątek[2] , Błażej Cieślik[1] , Joanna Szczepańska-Gieracha[1], Waldemar Andrzejewski[1]

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[2]Independent Public Health Care Center of the Ministry of the interior and Administration in Wroclaw, Department of Gynaecology, Wroclaw, Poland

Using virtual reality in physiotherapy for women with urinary incontinence

Abstract:

Urinary incontinence (UI) affects nearly half of postmenopausal women and has a significant impact on quality of life, social functioning, and psychological well-being. Traditional pelvic floor muscle training (PFMT) requires active engagement and long-term motivation, which poses a challenge for many patients. This study aimed to assess whether the integration of virtual reality (VR) into standard urogynecological therapy could help reduce symptoms and improve the quality of life of women with overactive bladder (OAB). The study was conducted among postmenopausal women diagnosed with OAB. Participants were randomly assigned to two groups: an experimental group, which received pelvic floor muscle electrostimulation with EMG biofeedback supported by VR visualization, and a control group, which received electrostimulation with biofeedback only. Each participant underwent eight therapy sessions over a two-week period. Assessments included gynecological examination, analysis of pelvic floor muscle EMG activity, and standardized quality of life questionnaires. The results showed that the use of VR significantly increased patient engagement, motivation, and awareness of pelvic floor muscle activity, which translated into better therapeutic outcomes and a reduction in OAB symptoms. The study demonstrates that virtual reality can be an effective complement to traditional physiotherapy, introducing a new dimension to personalized treatment of urinary incontinence and potentially transforming urogynecological rehabilitation practice.

Keywords: Virtual reality; Pelvic floor rehabilitation; Overactive bladder

Biography: Dr. Gabriela Kołodyńska, In December 2020, She earned my PhD in Physical Culture Sciences. In September 2020, She obtained the title of urogynecological therapist.She have authored and co-authored numerous publications in peer-reviewed scientific journals. She am currently conducting research projects related to the use of the latest physiotherapy methods in the treatment of urinary incontinence in women.

doi.org/10.51219/URForum.2025.Gabriela-Kolodynska ISBN: 978-1-917892-27-8

Prof. Vincenzo Campagna

Military Hospital of Rome, Italy

Aetiopathogenesis of Rotator Cuff Tear in Patients Younger than 50 Years: Medical Conditions Play a Relevant Role

Abstract:
Studies on rotator cuff tears (RCT) in patients younger than 50 years have focused on the post-operative outcomes. Little is known about cuff tear etiopathogenesis, although it is a common belief that most tears are due to trauma. We have retrospectively verified the prevalence of medical conditions, whose role in tendon degeneration development have been widely demonstrated, in a group of patients younger than 50 years with postero-superior RCT.

Materials and Methods: 64 patients [44M-20F; mean age (SD): 46.90 (2.80)] were enrolled. Personal data, BMI, smoking habit, diseases (diabetes, arterial hypertension, hypercholesterolaemia, thyroid diseases, and chronic obstructive pulmonary disease) were registered. The possible triggering cause and the affected side and tear dimensions were recorded, and statistical analysis was then performed.

Results: 75% of patients had one or more diseases and/or a smoking habit for more than 10 years. In the remaining 25%, only four patients referred had had a traumatic event, while in the other eight patients, both medical condition and trauma were registered. The presence of two or more diseases did not affect RCT size.

Conclusions: In our series, three quarters of patients with RCT had a smoking habit or medical conditions predisposing them to a tendon tear; therefore, the role of trauma in RCT onset in patients younger than 50 years is markedly resized. It is plausible that in the remaining 25%, RCT may be due to trauma or to genetic or acquired degeneration.

Biography: Prof. Vincenzo Campagna is a distinguished medical professional affiliated with the Military Hospital of Rome, Italy. With extensive clinical and academic experience, he has made significant contributions to the fields of rehabilitation medicine, physiotherapy, and physical health management. Prof. Campagna has been actively involved in developing advanced therapeutic strategies for musculoskeletal and neurological rehabilitation, integrating modern physiotherapeutic approaches with evidence-based medical practice. His research interests include sports injury recovery, functional mobility restoration, and innovative rehabilitation techniques for military personnel and civilians. Throughout his career, he has collaborated with interdisciplinary teams to enhance patient care outcomes and promote holistic recovery programs. As an educator and mentor, Prof. Campagna is dedicated to training future healthcare professionals, emphasizing the importance of precision, ethics, and innovation in rehabilitation science. His commitment to advancing clinical rehabilitation continues to inspire excellence within the Italian and international medical communities.

doi.org/10.51219/URForum.2025.Vincenzo-Campagna ISBN: 978-1-917892-27-8

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Microbiome features associated with performance in an athletic cohort and nonathletic controls

Abstract:

We investigated whether gut microbiome characteristics predict performance capacity and influence acute biomarker responses across different exercise modalities. One male collegiate cohort, consisting of endurance and strength athletes, as well as physically active controls, completed maximal anaerobic Wingate and aerobic Bruce treadmill tests. Metagenomic (shotgun) sequencing was used to profile stool at baseline and after exercise, and serum panels were used to capture inflammatory and metabolic markers. At baseline, alpha and beta diversity did not differ between groups, however approximately one-third of the detected species were unique to a group. Longitudinal analyses revealed an increase in Alistipes communis specific to strength after the Wingate test and identified 88 species that differentiated groups during the Bruce test. Correlation networks linked performance to taxa. Bifidobacterium longum and B. adolescentis were strongly associated with VO_{2max} and power outputs. While most circulating markers showed similar time courses in all groups, SPARC and adiponectin varied by modality and training background. After the Wingate test, strength-trained athletes showed distinct associations between their microbiome and biomarkers. This group also exhibited baseline enrichment of Clostridium phoceensis and Catenibacterium, which was associated with a reduced Bruce response. These findings suggest associations between specific gut taxa and aerobic capacity or power. Training background may shape microbiome to host coupling during recovery in a modality-dependent manner.

Keywords: gut microbiome, VO2max, Wingate test, Bruce test, biomarkers, recovery

doi.org/10.51219/URForum.2025.Kinga-Huminska-Lisowska ISBN: 978-1-917892-27-8

This research was conducted as a part of the National Science Center, Poland project (grant no. 2018/29/N/NZ7/02800) and co-financed from the state budget under the program of the Minister of Education and Science, "Science for Society II", project no. NdS-II/SP/0503/2024/01. The amount of the grant was 1 million PLN and the total value of the project was 1 million PLN.

Biography: Dr Kinga Humińska-Lisowska is Head of the Genetics in Sports Laboratory and Laboratory Centre Coordinator at the Gdańsk University of Physical Education and Sport. Her work spans human and sport genetics, with current projects on exercise-induced muscle damage, inflammation, and the impact of physical activity on the gut microbiome. She investigates molecular bases of training adaptation using whole-metagenome and multi-omics approaches, and translates advanced genetic analyses into diagnostics for personalized medicine. She leads cross-sector collaborations and has published widely with recognized awards for young scientists.

doi.org/10.51219/URForum.2025.Kinga-Huminska-Lisowska ISBN: 978-1-917892-27-8

Prof. Dr. S. Purna Chandra Shekhar

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Comparative Effectiveness of Artificial Intelligence–Assisted 3D Printed Customized Knee Brace and Exercise Therapy Versus Conventional Electrotherapy in Ergonomical Knee Pain: A Randomized Controlled Study

Abstract:

Background: Ergonomical knee pain is an increasing musculoskeletal issue among adults caused by prolonged sitting, poor posture, and repetitive occupational stress. Technological advancements in physiotherapy, such as Artificial Intelligence (AI)–based exercise monitoring and 3D-printed customized knee braces, provide individualized treatment approaches to enhance knee function and reduce pain.

Purpose: To compare the effectiveness of AI-assisted knee exercise therapy combined with 3D-printed customized knee braces and heating pad versus conventional electrotherapy modalities (TENS, ultrasound) with strengthening exercises in patients with ergonomical knee pain.

Methods: A randomized controlled study was conducted at the Department of Physiotherapy, MNR Hospital, MNR University, Sangareddy, Telangana, India. Sixty participants (30 males, 30 females) aged 25–50 years with ergonomical knee pain. Participants were randomly allocated into two groups (n=30 each).Group A: Received AI-guided knee exercise program, heating pad, and customized 3D-printed knee brace.Group B: Received conventional electrotherapy with knee strengthening exercises. Both groups received psychological counseling to enhance motivation and adherence. Treatment duration was 6 weeks, five sessions per week. Outcome measures included Visual Analogue Scale (VAS) for pain, Knee Injury and Osteoarthritis Outcome Score (KOOS), and muscle strength grading.

Results: Both groups showed significant improvement ($p<0.05$) in pain and function, but Group A demonstrated superior gains in VAS, KOOS, and strength, with higher satisfaction and adherence.

Conclusion: AI-assisted exercise therapy with 3D-printed braces is more effective than conventional electrotherapy in improving pain, strength, and function in ergonomical knee pain.

Keywords; Ergonomical knee pain, Artificial Intelligence, 3D printing, knee brace, electrotherapy, physiotherapy, TENS, ultrasound, strengthening exercises

doi.org/10.51219/URForum.2025.S-Purna-Chandra-Shekhar ISBN: 978-1-917892-27-8

November 13-14, 2025 | Lisbon, Portugal

Biography: Prof. Dr. S. Purna Chandra Shekhar is a distinguished Professor of Cardio Physiotherapy at MNR University, Telangana, India. I am WHO-certified Wheelchair Trainer and currently serves as President of the Indian Association of Physiotherapists (Telangana Branch) and Central Vice President of the Physiotherapy Confederation of Intellectuals. With numerous national and international publications, patents, and awards, he has significantly contributed to physiotherapy education, research, and innovation. An accomplished author of two books, Dr. Purna Chandra Shekhar is dedicated to advancing rehabilitation science and promoting evidence-based physiotherapy practice across India and beyond.

doi.org/10.51219/URForum.2025.S-Purna-Chandra-Shekhar ISBN: 978-1-917892-27-8

Agnieszka Opala-Berdzik[1], Magdalena Rudek-Zeprzałka[2], Justyna Niesporek[1], Maciej Cebula[3], Jan Baron[4], Katarzyna Gruszczyńska[4], Augusto Gil Pascoal[5], Patrícia Mota[5,6], Daria Chmielewska[7]

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How Should We Measure Inter-Recti Distance Using Ultrasound Imaging? Findings from a Scoping Review and Recommendations for Practice

Abstract: Measurement of the inter-recti distance (IRD) using ultrasound imaging is widely employed in physiotherapy practice and research concerning pregnancy-related diastasis recti abdominis (DRA). However, differences in methodology across studies limit comparisons of data between studies and clinical applications. Our scoping review aimed to identify and synthesize the technical aspects of IRD measurement procedures with ultrasound imaging*. The review followed PRISMA-ScR guidelines and included 49 peer-reviewed studies from an initial pool of 511 records. Extracted data were organized into main procedural areas, such as participant body position, respiratory phase, measurement site selection, and DRA screening criteria.

doi.org/10.51219/URForum.2025.Agnieszka-Opala-Berdzik ISBN: 978-1-917892-27-8

Measurement of the inter-recti distance (IRD) using ultrasound imaging is widely employed in physiotherapy practice and research concerning pregnancy-related diastasis recti abdominis (DRA). However, differences in methodology across studies limit comparisons of data between studies and clinical applications. Our scoping review aimed to identify and synthesize the technical aspects of IRD measurement procedures with ultrasound imaging*. The review followed PRISMA-ScR guidelines and included 49 peer-reviewed studies from an initial pool of 511 records. Extracted data were organized into main procedural areas, such as participant body position, respiratory phase, measurement site selection, and DRA screening criteria.

Biography: Agnieszka Opala-Berdzik, PhD, is a Physiotherapist and an Associate Professor at the Academy of Physical Education in Katowice, Poland. Her research interests focus on women's health physiotherapy, including assessment and treatment of diastasis recti abdominis using musculoskeletal ultrasound imaging. She has published widely in peer-reviewed journals and leads collaborative national and international research projects. She is also involved in physiotherapy education and evidence-based clinical practice.

doi.org/10.51219/URForum.2025.Agnieszka-Opala-Berdzik ISBN: 978-1-917892-27-8

Rebecca Kimber, Clinical Speech and Language Therapist, Anne Rodger, Clinical Specialist Physiotherapist, Dr Gerry Christopfi, Consultant Neurologist

University College Hsopital London, The National Hospital for Neurology and Neurosurgery, London, United Kingdom

Investigating the experience of people with oral difficulties as a result of peripheral facial palsy

Abstract: It is estimated that 22,500 people experience peripheral facial palsy (PFP) in the UK per year. People with PFP often experience oral deficits (OD) including difficulty eating, drinking, communicating, smiling, managing saliva, and creating a lip seal for leisure and vocational activities. There are no studies exploring patient's experiences of OD in PFP. This study aimed to understand the current literature into OD and facial palsy rehabilitation as well as explore participant's individual and shared experiences of OD and the impact on quality of life using a phenomenological framework. Public and patient involvement (PPI) was engaged to co-design the study. Purposive sampling techniques recruited participants through social media and PFP charities. A Reflexive Thematic Analysis approach was utilised for data analysis. Thirteen participants with PFP due to various aetiologies took part. 3 Focus groups were convened. All participants were from a white-British background, age range was 24-66 years of age, and participants were geographically scattered throughout the UK. Five intersecting themes were derived from the data: Experiences of mouth and lip difficulties, Experiences of other physical difficulties, Living with OD, The psychological impact of OD, Expectations for recovery. OD had a significant impact on the participant's psychological well-being, participation, function and QOL. The results of this study confirmed current literature and shed light on individual experiences with OD not addressed previously. Greater insight into the patient experience of OD will directly impact clinical practice, provide a platform for future research and development of outcome measures specific for OD and measuring rehabilitation interventions.

Keywords: facial therapy, facial palsy, facial rehabilitation, qualitative research, oral incompetence

Biography: Rebecca is a clinical speacialist speech and language therapist who works with complex neurological, neuromuscular and neurodegenerative conditions. Her clinical specialist interest is in the treatment of peripheral and central facial palsy. She recently compelted her Masters in Clinical Research, focusing on patients experiences in facial palsy. Rebecca has authored several papers on rehabilitation techniques in facial rehabilitation.

doi.org/10.51219/URForum.2025.Rebecca-Kimber ISBN: 978-1-917892-27-8

Dalton Kina

University of São Paulo School of Medicine, Brasil

Applicability of an unstable platform integrated with virtual reality in the rehabilitation of postural control

Abstract:

Introduction: Cognitive-sensorimotor tasks can be developed safely in controlled environments, using unstable surfaces and motion sensors. Gamification concepts associated with the control of the progression of this instability can be applied in the development of new devices in virtual reality environments. Finally, the application of neuroscientific principles that underlie postural control training and motor learning can enhance the positive effects of innovative technological tasks applied in rehabilitation.

Objective: To evaluate the applicability of an unstable platform integrated with virtual reality developed for cognitive-sensorimotor training in a virtual environment aimed at the rehabilitation of postural control. Method: 35 healthy, experienced physical therapists, 26 (74.3%) female, underwent immersive and non-immersive system interventions. Then, participants answered a questionnaire that assesses the necessary requirements for postural control training, the System Framework for Postural Control (SFPC). In addition, they answered the Simulator Sickness Questionnaire (SSQ), to assess the tolerability of the solution, and the System Usability Scale (SUS), which measures the acceptability of new devices.

Results: The total average in the SFPC was 7.7 (1.3) for immersive task and 7.9 (1.3) for non-immersive task ($p = 0.2$). In the SSQ, the average total score was 7.4 (14.4) for immersive task and 2.5 (10.5) for non-immersive task ($p = 0.04$). The average total score in the SUS was 77.4 (14.4) for the immersive task and 82.4 (10.5) for the non-immersive task ($p = 0.03$).

Conclusion: The unstable platform integrated with virtual reality (VR) was considered applicable, safe and acceptable for postural control training.

Keywords: Postural control. Virtual reality exposure therapy. Interactive simulators. Video games. Motivation. Neuroplasticity

doi.org/10.51219/URForum.2025.Dalton-Kina ISBN: 978-1-917892-27-8

Biography: Physiotherapist by Federal University of São Carlos, Master of Science by Hospital das Clínicas of the University of São Paulo School of Medicine (USP). Co-founder of Fisioatual, and main researcher in the project "Unstable Robotic Platform linked to Virtual Reality for Rehabilitation", supported by the PIPE Innovation Program of the São Paulo Research Foundation - FAPESP. Member of the International Society for Virtual Rehabilitation (ISVR.org), and of LETEFE - Laboratory of Studies in Technology, Functionality and Aging of the Department of Physiotherapy of the Faculty of Medicine of the University of São Paulo (USP). Collaborator at LIETEC-UFSCar/CNPq - Laboratory of Innovation and Entrepreneurship in Assistive Technology.

doi.org/10.51219/URForum.2025.Dalton-Kina ISBN: 978-1-917892-27-8

Betsy Keller, PhD, Candace Receno, PhD

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Recovery from Exercise in Persons with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)

Abstract:
There is little objective evidence regarding the temporal characteristics of recovery following exertion in people with myalgic encephalomyelitis (ME/CFS). Post-exertion malaise (PEM) is a hallmark symptom with characteristics varying between individuals. Importantly, exertional load is comprised not only of physical stressors, but also cognitive and emotional stressors; consequently, PEM may be provoked by any combination of these factors. Serial ratings of 9 common ME/CFS symptoms before exercise (baseline), before each of two sequential cardiopulmonary exercise tests (2-d CPET), and for 10 d following CPET-1 revealed significant differences in recovery time for 80 ME/CFS (12.7 d) and 64 inactive controls (CTL; 2.1 d). Further, recovery time for ME/CFS varied by duration of illness. However, recovery time did not differ between groups when separated by baseline PEM ratings (high, intermediate, low). The 'half-life' of recovery, or duration for PEM symptoms to diminish by one-half, differed from a few hours (CTL) compared to a few days (ME/CFS). Physical activity (PA) measured by accelerometry in a smaller sample from the same cohort (ME/CFS n=58; CTL n=51) 6 d before (baseline) and 10 d after 2-d CPET indicated that ME/CFS spent more time in sedentary PA compared to CTL. A comparatively higher level of sedentary PA in ME/CFS persisted during both daytime and nighttime hours. A higher level of sedentary activity occurred in ME/CFS particularly during the first three days following 2-d CPET but required the full 8-10 d of post-exercise surveillance to return to baseline PA. Conclusion: Recovery duration for ME/CFS following exertion is protracted and does not comport with standard exercise prescription guidelines. Efforts to exert before complete recovery will further exacerbate illness symptoms and prolong PEM.

Keywords: Post-exertional malaise, exertion intolerance, fatiguing illness

Biography: For over two decades she has used a 2-day CPET protocol to study and objectively assess functional capacity in those with fatiguing illnesses. In 2015 she served on the Institute of Medicine committee to study ME/CFS and has given numerous scientific and invited presentations on fatiguing illnesses nationally and internationally. She was the Co-Coordinator of the Clinical Core for a multi-site 5-year NIH-funded Collaborative Research Center to study ME/CFS. Presently, she is a principal in the newly established non-profit PaceForward Foundation where the team continues to provide objective assessment of functional capacity and recovery for those with fatiguing illnesses.

doi.org/10.51219/URForum.2025.Betsy-Keller ISBN: 978-1-917892-27-8

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Relationship between lean body mass and motor function in ambulant patients with Duchenne muscular dystrophy

Abstract:

Background: Duchenne muscular dystrophy (DMD) leads to progressive muscle weakness and atrophy. Recent studies indicate that body composition measured by dual-energy X-ray absorptiometry (DXA) may serve as a biomarker of disease progression. While reduced lean body mass (LBM) is known to correlate with poorer motor outcomes, the role of physical activity level in this relationship remains insufficiently explored.

Objective: This study aimed to evaluate the correlation between muscle function, assessed by accelerometry and standard motor tests, and lean body mass measured by DXA in ambulant patients with DMD.

Methods: The study included 20 ambulant patients with DMD (Vignos scale 1–3), aged 6–15 years. Physical activity was monitored for 7 days using GT3X Actigraph accelerometers. Motor function was evaluated with the North Star Ambulatory Assessment (NSAA) and the 6-Minute Walk Test (6MWT). Total LBM was measured by DXA during the clinical visit. Spearman correlation coefficients were calculated to explore associations between LBM, motor outcomes, and activity parameters.

Results: Participants walked 101–477 m in the 6MWT, scored 9–34 points on the NSAA, and averaged 4,936–9,166 steps/day. Half of the group spent more than 50% of daily time sedentary. The proportion of time spent in moderate activity correlated positively with both motor outcomes and percentage of LBM.

doi.org/10.51219/URForum.2025.Agnieszka-Sobierajska-Rek ISBN: 978-1-917892-27-8

Conclusions: DXA appears to be a useful tool for monitoring motor status in DMD. Accelerometry provides valuable insight into daily activity and may support strategies to encourage lifestyle modifications aimed at preserving independence and physical function.

Keywords: Duchenne muscular dystrophy, lean body mass, accelerometry, motor function

Biography: Agnieszka Sobierajska-Rek, PhD, PT is an associate professor at the Department of Rehabilitation Medicine, Medical University of Gdańsk, Poland. She works as a physiotherapist at the Center for Rare Diseases, specializing in motor assessment and physiotherapy care for patients with Duchenne muscular dystrophy (DMD). She is the author and co-author of numerous scientific publications. Her research focuses on multidisciplinary care in DMD and advanced methods of motor assessment, aiming to improve standards of rehabilitation and quality of life for patients with rare neuromuscular disorders.

doi.org/10.51219/URForum.2025.Agnieszka-Sobierajska-Rek ISBN: 978-1-917892-27-8

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No Effect of Shockwave and Ultrasound Therapy on Jump Performance and Kinesthetic Differentiation Ability in Patients with Achilles Tendinopathy: A Pilot Study

Abstract:
Randomized controlled trials have demonstrated that, according to the subjective assessment of patients with non-insertional Achilles tendinopathy, radial shockwave therapy (RSWT) is significantly more effective than ultrasound therapy in alleviating pain intensity and improving their function and activity (Stania et al., 2023,2024). However, there is still a need for objective methods to evaluate the therapeutic effectiveness of these interventions. Inclusion criteria for the study were: (1) pain located 2 to 6 cm proximal to the Achilles tendon insertion; (2) symptoms lasting longer than 3 months; (3) midportion tendon abnormalities; (4) recreational physical activity. Countermovement jump (CMJ) analysis was conducted on 28 patients who were randomly allocated to one of three groups: RSWT (Group A), ultrasound therapy (Group B), or placebo ultrasound (Group C). All participants performed three maximal CMJs (100% effort) and three submaximal CMJs (50% effort) on a force platform, assessed at baseline, one week, and six weeks post-treatment. The analysis included the following variables: maximum force, velocity, maximum power, countermovement depth, jump height, and the differentiation index for jump height between maximal and submaximal efforts. A two-way ANOVA (3 × 3: time × group) was used for statistical analysis. Post-hoc comparisons were conducted using the Bonferroni test. The group × time interaction was not statistically significant for any of the CMJ variables at either effort level. No significant differences were also found for the differentiation index. RSWT and ultrasound therapy did not improve vertical jump performance in patients with non-insertional Achilles tendinopathy. Additionally, these patients exhibited impaired kinesthetic differentiation ability, which was not influenced by mechanotherapy. This study was prospectively registered in the Australian and New Zealand Clinical Trials Registry (ACTRN12617000860369; registration date: 09.06.2017).

Keywords: Achilles tendinopathy, extracorporeal shock wave therapy, ultrasonic waves, countermovement jump, therapeutics

Biography: Magdalena Stania, PhD, is a physiotherapist and an Associate Professor at the Academy of Physical Education in Katowice, Poland. Her research interests include physical therapy in musculoskeletal disorders, postural control in children and adults, the effects of whole-body vibration training on the human body, and evidence-based medicine. She is the co-author of 38 scientific articles published in peer-reviewed journals with an impact factor. She has also served as a principal investigator in several research projects.

doi.org/10.51219/URForum.2025.Magdalena-Stania ISBN: 978-1-917892-27-8

Orin Yardeni & Michal Scharf,
Loewenstein Rehabilitation Medical Center, Ra'anana, Israel

Anna Oksamitni, Hiela Lehrer, Ilana Gelernter, Michal Scharf, Lilach Front, Olga Bendit-Goldenberg, Amiram Catz, and Elena Aidinoff.

Reliability and Validity of the Lowenstein Communication Scale

Abstract:

Background/Objectives: The Lowenstein Communication Scale (LCS) is a tool for the evaluation of communicative performance in patients with disorders of consciousness (DOC). This study investigated the reliability and validity of the LCS.

Methods: We evaluated 23 inpatients with unresponsive wakefulness syndrome (UWS) and 18 in a minimally conscious state (MCS), at admission to a Consciousness Rehabilitation Department and one month later. The evaluations included assessments of LCS by two raters, and of the Coma Recovery Scale–Revised (CRS-R) by one rater.

Results: Total inter-rater agreement in LCS task scoring was found in 58–100% of the patients. Cohen's kappa values were >0.6 for most tasks. High correlations were found between the two raters on total scores and most subscales ($r = 0.599–1.000$, $p < 0.001$), and the differences between them were small. LCS subscales and total score intraclass correlations (ICC) were high. Internal consistency was acceptable (Cronbach's $\alpha > 0.7$) for most LCS subscales and total scores. Moderate to strong correlations were found between LCS and CRS-R scores ($r = 0.554–0.949$, $p < 0.05$), and the difference in responsiveness between LCS and CRS-R was non-significant.

Conclusions: The findings indicate that the LCS is reliable and valid, making it a valuable clinical and research assessment tool for patients with DOC.

Keywords: minimally conscious state; unresponsiveness wakefulness syndrome; consciousness disorders; reliability; validity; assessment of communication

doi.org/10.51219/URForum.2025.Orin-Yardeni ISBN: 978-1-917892-27-8

Biography: Orin Yardeni is a Speech-Language Pathologist at the Department of Rehabilitation of Communication Disorders, Loewenstein Rehabilitation Medical Center, Israel. With extensive clinical expertise, she specializes in the rehabilitation of patients with disorders of consciousness (DOC), implementation of Augmentative and Alternative Communication (AAC) strategies, and facilitating group therapy for communication recovery. Her work focuses on improving the quality of life and functional communication outcomes for individuals with severe neurological impairments. Orin is an active contributor to the field of neurorehabilitation and cognitive recovery, sharing her knowledge through oral presentations and professional collaborations.

Michal Scharf is a dedicated Speech-Language Pathologist in the Department of Rehabilitation of Communication Disorders, where she specializes in the assessment and treatment of speech, language, and communication challenges across diverse patient populations. With strong clinical expertise and a commitment to evidence-based practice, she plays an essential role in supporting patients with communication impairments resulting from neurological, developmental, and acquired conditions. Michal contributes to advancing rehabilitation outcomes through individualized therapy, interdisciplinary collaboration, and a patient-centered approach, helping individuals improve communication skills and enhance overall quality of life.

doi.org/10.51219/URForum.2025.Orin-Yardeni ISBN: 978-1-917892-27-8

Jing Gao, MD

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Ultrasound Shear Wave Elastography to Assess Adult Skeletal Muscles

Abstract:

A clinical unmet need in rehabilitation medicine is to develop non-invasive, quantitative, and cost-efficient techniques for quantifying the severity of the disease/disability and evaluate treatment effects. To investigate the feasibility of ultrasound shear wave elastography (SWE) for assessing the stiffness of the affected skeletal muscles and evaluating the effectiveness of treatment in rehabilitation, we performed SWE on adult patients with post-stroke spasticity and non-specific chronic neck pain after obtaining IRB approval and informed consent. Shear wave velocity (SWV, meters per second) on SWE images of the muscle was measured in patients with post-stroke spasticity and neck muscle hypertonicity before and after treatments with BoNT-A and osteopathic manipulative treatment (OMT), respectively. The difference in SWV values measured between healthy controls and patients, and before and after treatment were analyzed using two-tailed paired t-test. Intra- and inter-observer reliability of performing SWE was analyzed using intraclass correlation coefficient. In the study, we observed significant difference in SWV in hypertonic and spastic muscles compared to that in normal muscles ($p < 0.01$). We also noted significant changes in SWV in affected muscles after treatment compared to that measured before the treatment ($p < 0.001$). Intra- and inter-observer reliability of performing SWE was good. Study results suggest that SWE is feasibile to assess the change in muscle's mechanical properties associated with spasticity and hypertonicity in patients with neuromuscular disorders and chronic neck pain. SWE can also evaluate the effectiveness of treatment for those conditions. The affected muscles are stiffer in patients with stroke and neck pain compared to non-affected normal muscles. The affected muscles become softer after treatment. Ultrasound SWE provides a non-invasive and quantitative imaging biomarker to assist rehabilitation.

Keywords: Chronic neck pain; hypertonicity; post-stroke spasticity, shear wave elastography

Biography: Jing Gao is a Professor/Director of ultrasound at Rocky Vista University (RVU) and Fellow in AIUM. Dr. Gao completed her medical education in China and came to the US as a visiting assistant professor of Radiology in 1989. She participated in clinical ultrasound service and research in the Department of Radiology, Weill Cornell Medicine for 27 years. She has been awarded several research grants by the NIH, AOA, and RVU. She has published a book, 3 book chapters, and 100 peer reviewed articles. She is an editorial board member on journals of Clinical imaging and Journal of Ultrasound in Medicine.

doi.org/10.51219/URForum.2025.Jing-Gao

ISBN: 978-1-917892-27-8

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Fostering Person-Centred Care in Physiotherapy Rehabilitation Practice

Abstract: The Person-Centred Rehabilitation (PCR) Model emphasises empathy and practical communication skills among healthcare professionals, and the World Confederation for Physical Therapy recognises PCR as essential for establishing therapeutic alliances within professional standards. However, implementing in PCR in physiotherapy practice faces specific challenges, particularly in developing these competencies among healthcare students, which creates a significant gap between the recognised importance and practical application. This presentation explores the integration of PCR in physiotheray rehabilitation practice, using data from a longitudinal study. A total of 183 undergraduate students of rehabilitation health programs including person-oriented (PO) professions (e.g., Physiotherapy) or technique-oriented (TO) professions (e.g., Medical imaging and radiotherapy) completed both the Patient-Practitioner Orientation Scale (PPOS) and the Jefferson Scale of Physician Empathy (JSPE) during their first and third academic years. Compared with the TO group, the third-year PO group (physiotherapy students) demonstrated significantly higher patient-centred attitudes and greater self-perceived communication skills. The pairwise comparison revealed significant differences between the first and third academic years, with PO showing a significant increase in empathy—an effect not observed in the TO group. These findings demonstrate that educational exposure and professional orientation have a significant influence on empathy and communication skill development, thereby addressing the implementation of some of challenges identified in the PCR Model. By affirming PCR as a care model with tangible applications, these results contribute to shaping strategies that foster more effective and personalized person-centred care across rehabilitation contexts, especially in physiotherapy.

Keywords: Person-Centred Rehabilitation; Empathy; Physiotherapy; Students; Rehabilitatin

Biography: Margarida Custódio dos Santos is a psychologist. She is 65 years old, the mother of three women, and the grandmother of two adorable children. She has worked in the healthcare field for 42 years and has been teaching in higher education for 40 years — 27 of which have been dedicated to training physiotherapists. She believes she has learned, and continues to learn, a great deal from her students. She experiences the reality of physiotherapy closely, as she has muscular dystrophy. Her area of practice and research focuses on chronic illness, particularly in pediatrics.

doi.org/10.51219/URForum.2025.Margarida-Custodio-dos-Santos ISBN: 978-1-917892-27-8

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Quantitative Evaluation of Surface Electromyography on Upper Limb Dystonia after Stroke

Abstract:

Objective: To explore the feasibility of evaluating the rehabilitation effect of surface electromyography (SME) on limb dystonia in hemiplegic patients after stroke， and to establish a quantitative range of surface electromyography parameters and modified Ashworth scale (MAS).

Methods: Surface electromyography (sEMG) was used to evaluate the root mean square (RMS) and integral electromyography (iEMG) of biceps brachii with the affected upper limbs during passive movement in patients with post-stroke spasm(MAS≤ III grade) . The above indexes of biceps brachii with different MAS grades were analyzed by one-way ANOVA， and the correlation between RMS and MAS scores was analyzed.

Results: The degree of spasticity MAS in upper limbs after stroke was correlated with RMS (P ＜ 0. 01) and iEMG(P ＜ 0. 01) of biceps brachii. There was no statistical difference between grade 0 and grade 1 of MAS (P ＞ 0. 05)， but there was statistical difference among other levels (P ＜ 0.05) .

Conclusion: Surface electromyography can be used to quantitatively analyze the degree of upper limb spasm in some stroke patients.

Keywords: Spasm after stroke， Surface electromyography

doi.org/10.51219/URForum.2025.Fan-Jiang

ISBN: 978-1-917892-27-8

Table 1 Correlation between iEMG and RMS of biceps brachii with different MAS grades

MAS	Grade 0	Grade I	Grade I +	Grade II	Grade III	*P* value	*R value*
N	9	10	10	8	5		
MAS score	0	1	2	3	4		
iEMG	19.79±1.21	20.83 ±4.80	33.52±3.85	57.76±11.32	119.23 ±12.46	0.000	0.822
RMS	6.77±1.11	7.33±1.49	10.16±1.71	12.98±1.78	20.55±2.46	0.000	0.873

Table 2 Comparison of iEMG of biceps brachii with different MAS grades ($\bar{x}\pm S$)

MAS	Grade 0	Grade I	Grade I +	Grade II	Grade III
iEMG	19.79±1.21	20.83 ±4.80	33.52±3.85	57.76±11.32	119.23 ±12.46
Compared with Grade 0 (*P value*)	-	0.999	0.000	0.000	0.001
Compared with Grade I (*P value*)	-	-	0.000	0.000	0.000
Compared with Grade I + (*P value*)	-	-	-	0.004	0.001
Compared with Grade II (*P value*)	-	-	-	-	0.000

doi.org/10.51219/URForum.2025.Fan-Jiang

ISBN: 978-1-917892-27-8

Table 3 Comparison of RMS of biceps brachii with different MAS grades ($\bar{x}\pm S$)

MAS	Grade 0	Grade I	Grade I +	Grade II	Grade III
RMS	6.77±1.11	7.33±1.49	10.16±1.71	12.98±1.78	20.55±2.46
Compared with Grade 0 (*P value*)		0.987	0.001	0.000	0.000
Compared with Grade I (*P value*)		-	0.010	0.000	0.001
Compared with Grade I + (*P value*)		-	-	0.039	0.001
Compared with Grade II (*P value*)		-	-	-	0.007

In patients with post-stroke spasticity, as muscle tone increases, resistance during passive movements rises, muscle discharge intensifies, and interval quantification can be performed between Grads other than Grade 0 and Grade I. During passive movements, the iEMG and RMS scores of the biceps brachii are correlated with its modified Ashworth grading.

Biography: Fan Jiang is a dedicated clinician and researcher in the Department of Neurology at Shapingba Hospital, affiliated with Chongqing University (Shapingba District People's Hospital of Chongqing), China. With strong expertise in neurological evaluation and patient care, Fan Jiang focuses on the diagnosis and management of a wide range of neurological disorders. Her clinical interests include stroke, neurodegenerative diseases, and neuromuscular conditions, supported by a commitment to evidence-based practice and continuous medical advancement. Through her work at one of Chongqing's leading medical institutions, she contributes to improving neurological outcomes and promoting high-quality, patient-centered care.

doi.org/10.51219/URForum.2025.Fan-Jiang

ISBN: 978-1-917892-27-8

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Effectiveness of Home-Based Circuit Training on Body Mass Index, Biochemical Parameters, and Musculoskeletal Fitness in Overweight or Obese Adults with Knee Osteoarthritis and Type 2 Diabetes Mellitus

Abstract:
Obesity, Type 2 Diabetes Mellitus (T2DM), and Knee Osteoarthritis (KOA) frequently coexist, leading to compounded functional limitations, chronic pain, and adverse health outcomes. Exercise is known to improve metabolic and musculoskeletal parameters; however, evidence-based protocols specifically tailored for individuals with these comorbidities remain limited. This study examined the effectiveness of a home-based circuit training (HBCT) program on body mass index (BMI), biochemical parameters, and musculoskeletal fitness in overweight or obese adults with KOA and T2DM. Seventy participants (mean age 62.2 ± 6.1 years; 56% female) were randomly assigned to either a 12-week HBCT intervention group (n = 35) or a no-exercise control group (CON, n = 35). The HBCT program comprised seven progressive exercises performed for 15–30 repetitions per set, with one-minute rest intervals between sets, across 2–4 rounds per session lasting 20–60 minutes. Outcome measures included BMI, inflammatory marker [Interleukin-6 (IL-6)], antioxidant enzyme [Superoxide dismutase (SOD)], Glycated hemoglobin (HbA1c), musculoskeletal fitness (six-minute walk test, 30-second chair stand test, and timed up-and-go), and pain score, assessed at baseline, mid-intervention, and post-intervention. Participants in the HBCT group showed significant improvements in BMI, IL-6, SOD, HbA1c, musculoskeletal fitness, and pain scores compared with the control group ($p < 0.05$). In conclusion, a 12-week HBCT program effectively reduced systemic inflammation, oxidative stress, and HbA1c while enhancing musculoskeletal fitness and alleviating pain in older adults with KOA and T2DM. These findings highlight the potential of structured, home-based exercise interventions as an accessible and evidence-based strategy to improve clinical outcomes in this high-risk population.

Keywords: Home-based circuit training; Knee osteoarthritis; Type 2 diabetes mellitus; Obesity; Musculoskeletal fitness

doi.org/10.51219/URForum.2025.Wan-Syaheedah-Wan-Ghazali ISBN: 978-1-917892-27-8

Biography: Wan Syaheedah Wan Ghazali is a Senior Lecturer in the Department of Physiology at Universiti Sains Malaysia, where she has served for 14 years. She holds an MBBS, an MSc in Medical Physiology, and a PhD in Cardiovascular Physiology from the University of Nottingham, United Kingdom. Her expertise includes Exercise Physiology, Cardiovascular Physiology, Oxidative Stress, and Natural Products & Complementary Medicine. Her research explores the role of exercise in managing Knee Osteoarthritis, Type 2 Diabetes Mellitus, and cardiovascular disorders. She has presented her work at national and international conferences and published in peer-reviewed journals.

doi.org/10.51219/URForum.2025.Wan-Syaheedah-Wan-Ghazali ISBN: 978-1-917892-27-8

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The effectiveness of radial shockwave therapy on myofascial pain syndrome: a two-armed, randomized double-blind placebo-controlled trial

Abstract:

Background: Myofascial pain syndrome (MPS) is a common, costly, and often persistent musculoskeletal condition. Radial shockwave therapy (RSWT) is one of the most frequently used treatments for MPS. However, there is limited evidence to support its short-term effectiveness, primarily due to the poor methodological quality of the studies. This study aimed to determine the effectiveness of radial shockwave therapy, compared with placebo treatment, in patients with MPS in the neck and upper back.

Method: A two-armed, randomized, double-blind, placebo-controlled trial was carried out in an outpatient physical rehabilitation department in a tertiary hospital. The sample comprised 70 adults aged 18 years or above with MPS. The intervention group received six treatment sessions. These consisted of RSWT: 1.5 bars (0.068 mJ/mm2), 2000 pulses, and a frequency of 15 Hz; and standard physical therapy stretches and exercises, including therapeutic home exercises. The control group received an identical treatment regime, except that they received a no-energy shock (nontherapeutic dose) of 0.3 bar (0.01 mJ/mm2). The outcome measures were the numeric pain score (NPS), neck disability index (NDI), pressure pain threshold (PPT), and SF-12 score at the 4-, 8-, and 12-week follow-ups.

Results: The study revealed a significant improvement ($p < 0.05$) in the NPS and PPT at the follow-up assessments (0–4, 0–8, and 0–12 weeks). The placebo group showed a significant difference in NDI scores at all intervals, whereas the shockwave group only showed significant improvement at 0–4 weeks. The shockwave group did not have significant changes in SF-12 scores, whereas the placebo group showed significant improvement in the SF physical score between 0–8 weeks ($p = 0.01$) and 0–12 weeks ($p = 0.02$). No statistically or clinically significant differences were observed between the placebo and shockwave groups across all outcomes at 4, 8, and 12 weeks.

doi.org/10.51219/URForum.2025.Collins-Ogbeivor

ISBN: 978-1-917892-27-8

Conclusion: No significant differences were found between the placebo and shockwave groups at 4, 8, and 12 weeks. However, both groups showed statistically and clinically significant improvements in the NPS and PPT. Both groups showed improvements in the NPS and PPT scores; therefore, we recommend using radial RSWT as an adjunct to standard care, which includes therapeutic home exercises for individuals with MPS.

Keywords: Myofascial pain syndrome, shockwave, physical therapy, randomised controlled trial

Biography: Dr. Collins Ogbeivor is a Consultant Physiotherapist with over 27 years of experience. He serves on the Hospital Research Ethics Committee and as the Director of the Saudi Board for Musculoskeletal Residency at King Faisal Specialist Hospital and Research Centre in Riyadh.

In 2012, he was appointed Consultant Extended Scope Physiotherapist at Virgin Care, UK. He contributed to the 2012 London Olympics and was honored by former UK Prime Minister David Cameron. Recently, he was nominated by the World Physiotherapy Congress 2023 as an Abstract Reviewer and Chair of e-posters for musculoskeletal and pain management. Dr. Ogbeivor has published in peer-reviewed journals, and he is an expert in MSK shoulder and spinal conditions.

doi.org/10.51219/URForum.2025.Collins-Ogbeivor

ISBN: 978-1-917892-27-8

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Effect of Pulmonary Rehabilitation and Inspiratory Muscle Training on Patients With Unilateral Diaphragmatic Eventration

Abstract:

Introduction: Diaphragmatic eventration (DE) is the abnormal elevation of one part or the entire hemidiaphragm. This can be caused by lack of muscle or nerve function while maintaining its anatomical attachments. The symptomatic patients of DE usually suffer from shortness of breath while rest or during physical activity along with reduced functional capacity.

Purpose: This study aims to investigate whether patients suffering from DE can derive benefits from pulmonary rehabilitation (PR) focusing on inspiratory muscle training (IMT).
Design: A case series involving quasi-experimental study to test effectiveness of PR and IMT program on participants who completed six weeks of program.

Methods: Four participants with DE who underwent six weeks regimen of PR focusing on IMT were recruited. The outcome measures of this study are: level of dyspnea measured by modified medical research council (mMRC), pulmonary function test (PFT) to test lung capacity and volume by looking at forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) respectively, and 6-minute walk test (6MWT) to test the functional capacity of the participants. The analysis was conducted using dependent t test to evaluate pre-post outcome measures.

Results: Four participants completed six weeks of PR with the focus on using IMT device. The dependent t-test for FEV1 and FVC revealed that there was a significant improvement after six weeks, $t(3) = -3.154$, $p < 0.05$, $t(3) = -2.529$, $p < 0.05$ respectively. The dyspnea scale (mMRC) showed significant improvement after six weeks $t(3) = 5.196$, $p < 0.05$. The functional capacity measured by the distance covered in 6MWT was improved significantly after six weeks $t(3) = -3.360$, $p < 0.05$.

doi.org/10.51219/URForum.2025.Amal-Albatini

ISBN: 978-1-917892-27-8

Conclusion: This study showed that pulmonary rehabilitation focusing on IMT can improve patients with DE alleviating dyspnea, as well as improving functional capacity. There might be an improvement of the pulmonary function and functional capacity of the patient without the need of surgical intervention.

Biography: Dr. Amal Albatini, Ph.D., CCRP, is a senior clinical researcher and certified cardiac rehabilitation professional at the Kuwait Cardiac Rehabilitation Centre, Chest Diseases Hospital in the Sabah Medical Area, Shuwaikh, Kuwait. With a strong background in cardiovascular rehabilitation and clinical research practices, she plays a key role in advancing evidence-based rehabilitation programs for patients recovering from cardiac conditions. Dr. Albatini's work focuses on improving functional outcomes, enhancing patient education, and optimizing long-term cardiac health through multidisciplinary care. She is recognized for her commitment to clinical excellence, research integrity, and her contributions to the development of modern cardiac rehabilitation services in Kuwait. And pic updated

doi.org/10.51219/URForum.2025.Amal-Albatini

ISBN: 978-1-917892-27-8

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Implementation of digital technology in the service of health protection for long-term care users

Abstract: Information and communication technology (ICT) solutions such as smartwatches and activity trackers, fitness apps, and VR fitness platforms make a significant contribution to promoting active aging. The World Health Organization emphasizes that the concept of active aging through digital technology aims to maintain and enhance physical, mental, and social well-being in older age, with the goal of achieving overall quality of life for the individual and their family. The advantages of including digital tools in proactive gerontological care are primarily reflected in the ability to collect objective and relevant health information which provides members of the multidisciplinary gerontological team with a holistic and personalized approach, while long-term care (LTC) users gain feedback on their health and it enables them to take an active role in the care process. The challenges faced by members of the multidisciplinary gerontological team when implementing digital tools in gerontological programs most often include the inability to adapt the user interface to the individual needs of LTC users, the users' lack of experience in the ICT environment, insufficient motivation, limited support from their surroundings for using computer technology, as well as users' misconceptions regarding privacy protection when applying digital tools. Continued implementation of ICT workshops, ensuring user-friendly interfaces with intuitive solutions focused on the individual needs of LTC users, the assurance of data protection and privacy, as well as the possibility of interaction with other users in online environments and retirement homes, all play a significant role in the long-term sustainability of technological solutions in gerontological programs.

Keywords: Digital technology, health, activity, long-term care

Biography: Currently employed as a senior lecturer at the Department of Physiotherapy in the field of Biomedicine and Health, area of Clinical Health Sciences, branch of Physical Medicine and Rehabilitation. Long-standing associate at the Slovenian Quality Assurance Agency for Higher Education. Participated in the realization of several scientific and professional projects. Author of several dozen scientific and professional publications cited in the Web of Science, Scopus, and Google Scholar databases. Editor and co-author of the first university textbook in the Republic of Croatia, Pulmonary Rehabilitation, in collaboration with Prof. Mirjana Turkalj, MD and Prof. Davor Plavec, MD.

doi.org/10.51219/URForum.2025.Ivana-Crnkovic

ISBN: 978-1-917892-27-8

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Inclusive Tourism as a Form of Physical Activity and Rehabilitation: Accessibility of Main Tourist Attractions in the Świętokrzyskie Region, Poland

Abstract:
The growing number of people with disabilities in Poland and worldwide highlights the urgent need to adapt various spheres of life, including tourism, which constitutes both a form of physical activity and an effective tool for rehabilitation and social integration. The study analysed the accessibility of twenty flagship tourist attractions in the Świętokrzyskie Region, an area with considerable natural, cultural, and historical potential. The research included four categories of attractions: recreation and entertainment facilities, museums and open-air museums, sacral monuments and historical and geological sites. A mixed-methods approach was applied, involving surveys with managers, site inspections, photographic documentation, and interviews, with accessibility assessed using a 0–3 point rating scale. The results showed a differentiated level of adaptation. Recreation and entertainment facilities demonstrated the highest accessibility, while sacral and historical monuments were least adjusted. The majority of solutions were directed towards visitors with mobility impairments, while the needs of blind, visually impaired, deaf, and hard-of-hearing individuals were often overlooked. Identified barriers included high financial costs of adaptation and limitations imposed by the heritage status of many sites. Importantly, the study emphasised the role of modern technologies such as audio-description systems, QR codes, and induction loops, alongside the necessity of staff training in inclusive practices. The results underline that accessible tourism should not be perceived solely in economic or cultural terms, but also as a component of physical rehabilitation and health promotion. Strengthening accessibility contributes to improving the quality of life of people with disabilities, supports their active participation in society, and enhances the therapeutic potential of tourism as part of broader physiotherapy and sports medicine strategies.

Keywords: inclusive tourism, people with disabilities, attraction accessibility, rehabilitation, physical activity, Świętokrzyskie Region

Biography: Klaudia Marcelina Chwaja is an academic teacher at the Institute of Tourism, Faculty of Tourism and Recreation, University of Culture Physical in Kraków, Poland. She holds a master's degree in Tourism and Recreation and specializes in accessible tourism, spa and pilgrimage tourism, and modern technologies in tourism. She is a co-author of several peer-reviewed publications and has presented research at national and international conferences, as well as led student scientific initiatives. Current research focuses on inclusive tourism and the accessibility of attractions for people with disabilities.

doi.org/10.51219/URForum.2025.Klaudia-Marcelina-Chwaja ISBN: 978-1-917892-27-8

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Transdermal Delivery of Botulinum Neurotoxin A: A Novel Formulation with Therapeutic Potential

Abstract:

Background: BoNTs are secreted from the Clostridium botulinum in the form of multimeric complexes, with a set of non-toxic proteins encoded for by a set of genes adjacent to the neurotoxin gene. Botulinum toxin A complex is the most lethal substance known to humans, with a LD50 in mice (1unit) ranging from 25 – 50 picograms. In spite of its toxic effects, botulinum toxin is considered as a wonder drug. Other than approved indications, botulinum toxin is frequently used for more than 800 off label neuro-muscular indications. Botulinum toxin is frequently administered to patients for treatment by injecting a composition containing botulinum toxin into affected the muscles and glands. Generally, the effective dose depends on the mass of muscle being injected. Other modes of administration have been considered, such as topical administration. Although major focus for topical administration has been to deliver small molecules, delivering large molecules, such as proteins, could be quite challenging. Several formulations and techniques are available to increase the permeability of molecules through the skin. However, permeability of big molecules, such as proteins, through skin is difficult. In addition, delivery of large molecules frequently requires other mediative techniques such as iontophoresis, ultrasound or microneedle. Skin is the largest organ of the body, protects humans from microbes, external pathogens, and other external environmental threats. Skin has three layers, a) the epidermis (the outermost layer of skin), b) the dermis (beneath the epidermis), and c) the hypodermis (the deeper subcutaneous dermis). One of the important functions of skin is to prevent the water loss and provides barrier for the entry of the molecules. No formulation exists which delivers the botulinum toxin without the help of any mediative techniques. What is needed therefore is a formulation or composition containing therapeutically effective amount of botulinum toxin which will permeate the toxin through the skin to demonstrate its efficacy in exerting the desired therapeutic effect.

Methods: The current work includes a method for formulating the toxin for topical applications, and a method for efficient delivery of botulinum toxin through skin as a topical medicine. Analytical methods were used for the characterization of a delivery vehicle. Efficacy of the delivery method was assessed by evaluating the Digital abduction score (DAS) after topical administration in gastrocnemius muscles of mice. Efficacy of topical delivery was also assessed in a mice model of hyperhidrosis.

Results: We have created four different variants of topical formulation with varying efficacies. Out of four formulations, we present the data for our best formulation. We were able to demonstrate the topical delivery of toxin using our nano-emulsion formulation in mice. We were able to get the efficacy in the range of 25 -100 units, showing asignificant reduction in sweating in mice.

doi.org/10.51219/URForum.2025.Raj-Kumar

ISBN: 978-1-917892-27-8

Conclusions: This is the first ever formulation for topical delivery of botulinum toxin without any aid of external technique or modification in the toxin. Studies related to mechanism of this delivery, and Franz cell assay are on-going. However, we have been able to successfully demonstrate the efficacy of the proposed formulation which is comparable to intramuscular administration.

Biography: Dr. Raj Kumar, PhD is an Associate Professor and Director of Academic Advisement and the Research Program at the Institute of Advanced Sciences in Dartmouth, Massachusetts, USA. With a strong academic background in biomedical sciences, Dr. Kumar has dedicated his career to advancing interdisciplinary research and mentoring emerging scholars. His leadership in academic advisement has significantly enhanced student engagement, curriculum development, and research innovation. Dr. Kumar's research interests span molecular biology, regenerative medicine, and translational research, where he has contributed numerous peer-reviewed publications and conference presentations. He is actively involved in international scientific collaborations and has served on various academic and editorial boards. Known for his commitment to academic excellence and scientific integrity, Dr. Kumar plays a key role in fostering a dynamic research environment. His work continues to shape the next generation of researchers while promoting global scientific dialogue and innovation.

doi.org/10.51219/URForum.2025.Raj-Kumar

ISBN: 978-1-917892-27-8

Dr. Mike Studer, PT, MHS, DPT, NCS, CEEAA, CWT, CSST, CSRP, CBFP, FAPTA

Adjunct Professor, Touro University Nevada - Las Vegas

The Pharmacists of Physical Activity: Physiotherapists and the provision of practical strategies to meet and exceed worldwide standards

Abstract:
Among the most controllable and inexpensive variables that we can manipulate in our lives, physical activity may have the greatest impact on our experience of aging. While nutrition could be argued to be more influential, it is not as cost neutral as physical activity. Sleep may be the only variable that could be less expensive and more effective, yet for many, sleep is not as consistently controllable as physical activity can be. In this keynote presentation, Dr. Mike Studer, a world-renowned physiotherapist, makes the case that physical activity is within our reach and control. Dr. Studer elaborates on the barriers to physical activity revolve around our uncomfortable relationship with one form of PA, being exercise. It is time for us to debunk the myths, reduce the friction, and improve our engagement with all forms of physical activity. This can be accomplished by leveraging the ABCs of wellness: autonomy, belief, and choice. In addition, Dr. Studer will demonstrate how we can leverage recent advances in motivation (behavioral economics), adoption (reducing friction, improving nudge), and life-based high intensity intervals (VILPA), to make PA goals more practical and desirable.

Keywords: physical activity, physiotherapy, dosage, exercise, wellness

Biography: Dr. Studer has been a PT since 1991, and board certified in neurologic PT since 1995. Dr. Studer is an adjunct professor at Touro University and additional appointment at UNLV as well as assisting the USC-led national network of neurologic PT residencies. Mike was recognized as the 2011 Clinician of the Year in the Neurologic and (in 2014) the Geriatric Academies of the APTA. He is well-traveled presenting invited lectures in all 50 states, 14 countries across 5 continents. Dr. Studer received the highest honor available in PT in 2020, being distinguished as a Fellow of the APTA in 2020. Dr. Studer has authored over 45 articles, 7 book chapters, and is a consultant to multiple professional and sponsored athletes. Most recently, he authored The Brain That Chooses Itself, a practical and applications-based guide to increasing both healthspan and lifespan for laypersons and medical professionals alike.

doi.org/10.51219/URForum.2025.Mike-Studer

ISBN: 978-1-917892-27-8

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Neuromodulation in multi-functional rehabilitation for patients with spinal cord injury

Abstract:
Spinal cord injury (SCI) is a devastating condition associated with widespread functional impairments, including profound disruptions of motor, respiratory, and cardiovascular systems, dysfunctions that are major contributors to long-term morbidity and mortality. While activity-based rehabilitation has demonstrated potential for promoting neural recovery, its efficacy is often constrained by the limited excitability of spinal networks below the lesion. Recent advances in neuromodulatory interventions, both invasive (epidural spinal cord stimulation) and non-invasive (transcutaneous spinal cord stimulation), have shown promise in enhancing spinal network excitability and facilitating neuroplasticity when combined with task-specific training. In this presentation, I will outline the pathophysiological basis of motor and autonomic deficits after SCI and review the methodology and rationale behind integrating neuromodulation into multi-functional rehabilitation strategies. Drawing from our clinical research program, I will present evidence supporting the efficacy of targeted spinal stimulation paradigms for restoring voluntary movement, stabilizing blood pressure, and improving respiratory motor control. These findings suggest that spinal neuromodulation, particularly when combined with activity-based interventions, may overcome intrinsic limitations of traditional therapies by enabling functionally meaningful recovery. The incorporation of these multi-modal strategies into clinical practice could represent a transformative shift in the rehabilitation of individuals with SCI and other neurological disorders.

Keywords: Spinal cord injury, Neuromodulation, Activity-based rehabilitation, Spinal cord stimulation, Neuroplasticity

Biography: Professor Alexander Ovechkin received his MD and PhD from Perm State Medical Academy. In 1999, he joined the University of Louisville, where he earned a second PhD in Physiology while investigating pulmonary-cardiovascular regulation. Since 2006, he has served on the faculty of the Department of Neurological Surgery and the Kentucky Spinal Cord Injury Research Center, where he established the Laboratory of Clinical Respiratory-Cardiovascular Neurophysiology. His research focuses on neurophysiological evaluation and rehabilitation of locomotor, respiratory, and cardiovascular deficits in spinal cord injury using activity-based therapies combined with invasive and non-invasive spinal neuromodulation. He leads multiple NIH-funded clinical trials.

doi.org/10.51219/URForum.2025.Alexander-Ovechkin

ISBN: 978-1-917892-27-8

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The effect of game-based intervention on locomotor skills of female students aged 9–11 years with flat foot

Abstract: Locomotor skills (LS) are an essential part of fundamental movement skills (FMS) that various factors such as lower limb deformities and proper training can affect the development of these skills. The purpose of this study was to determine the effect of game-based intervention on LS of female students with flat foot. To conduct this study, 18 female students aged 9–11 years with flat foot were selected as a convenience sampling. Then they were randomly divided in two control and experimental groups. The experimental group (EG) played a series of selected games for 6 weeks with the aim of improving LS and flat foot. Before and after the intervention, the flat foot of all participants was measured with the STAHELI index. In addition, the pre-test and post-test of the Test of Gross Motor Development second edition (TGMD-2) were taken. The results of the paired-samples t test showed a significant difference between the LS mean score of pre-test and post-test of the EG and that this difference was not significant in the CG (t_{EG} = 4.79,p_{EG} = .001;t_{CG} = 1.38, p_{CG} = .205). In addition, an independent samples t -test showed that the LS mean score of the the EG increased significantly compared to the CG in the post-test (t = 2.54, p = 0.022). Furthermore, regarding the flat foot score (FFS), the paired t test did not show any significant difference between pre-test and post-test of any groups (t_{EG} = .539, p_{EG} = .604; t_{CG} = 1.41, p_{CG} = .196). A game-based intervention improved the LS of 9–11 year-old female students with flat foot.

Keywords: Locomotor skills (LS), Fundamental movement skills (FMS), Flat foot, Game-based intervention

Biography: I am a sports science researcher and educator focusing on kinesiology, musculoskeletal disorders, and Adaptive physical education. My academic background includes a master's degree in sports injury and corrective exercise, complemented by extensive research on gait kinematics, balance, and postural assessment in athletes and individuals with disabilities. Through systematic reviews and experimental studies, I have contributed to the understanding of corrective exercise interventions and their applications in sports medicine. My work extends to teaching and translating academic materials in sports sciences, integrating scientific knowledge with practical applications.

ISBN: 978-1-917892-27-8

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NOVEMBER 2026

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