TECHNOLOGY SUPPORTED REHABILITATION: CURRENT SCENARIO, EMERGING TRENDS

2nd International Tele Neuro Rehabilitation Conference

Joint Meeting with

14th Annual Conference of IFNR

IFNRCON2026

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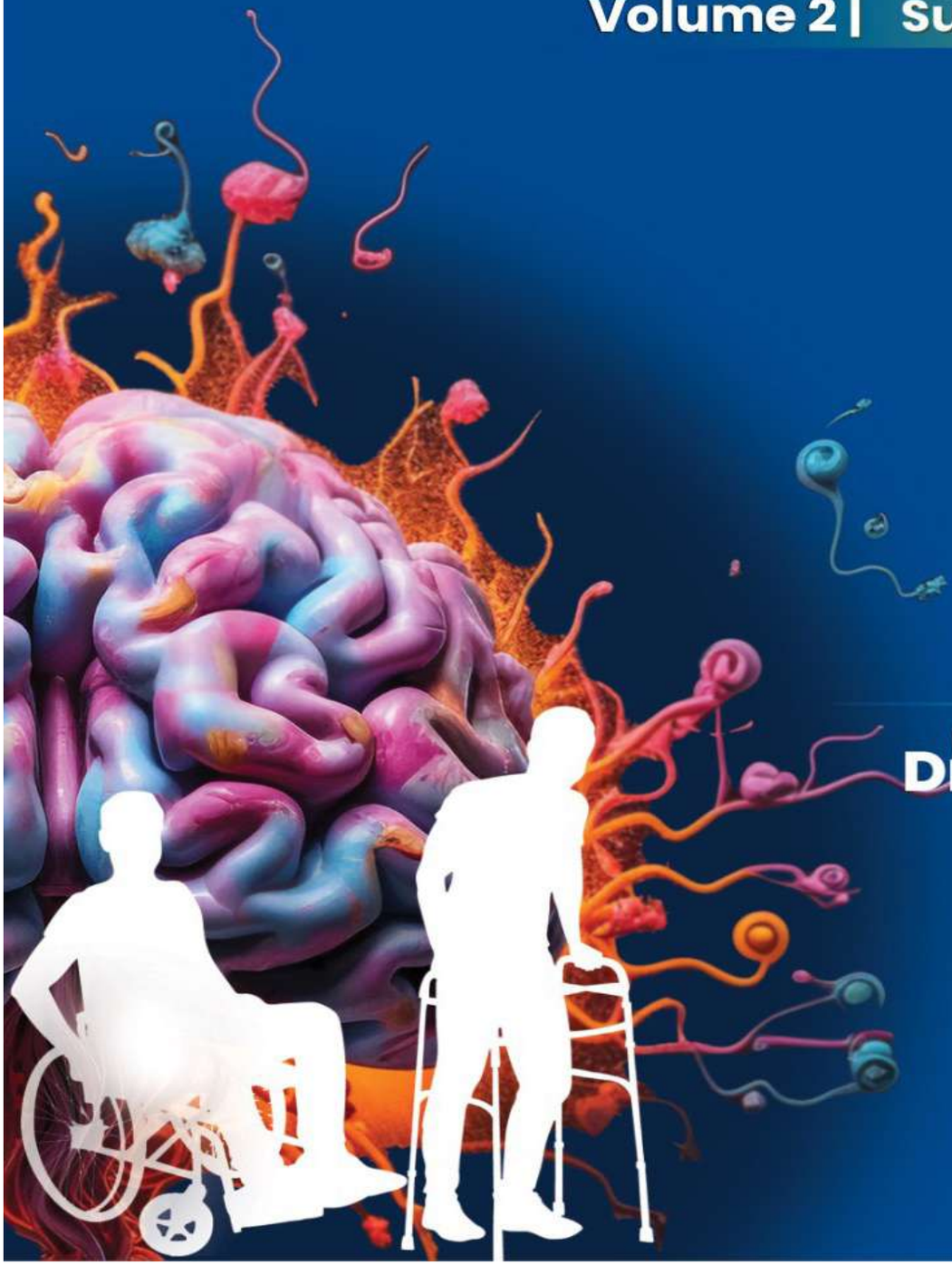

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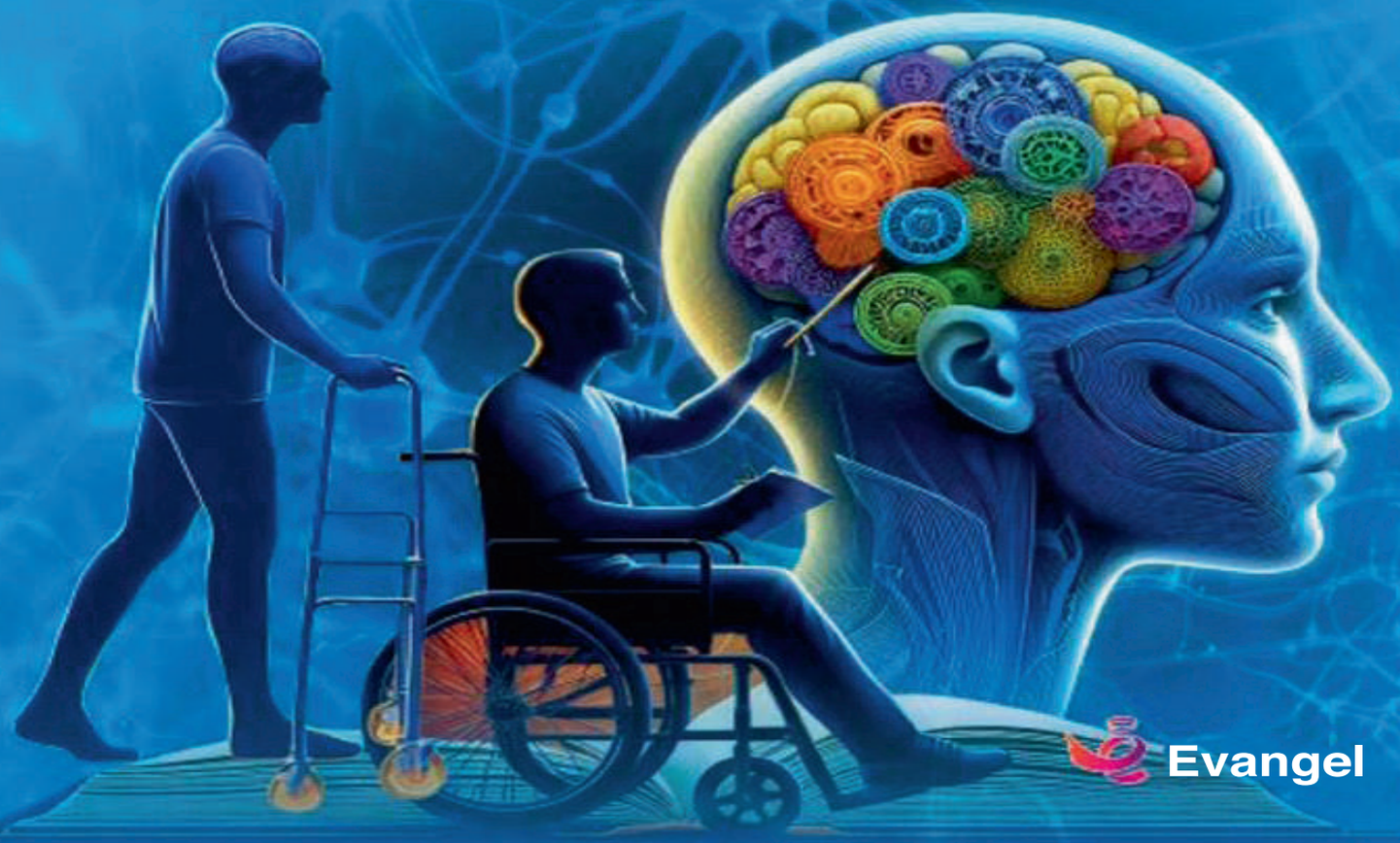

Evangel

2 International Tele Neuro Rehabilitation Conference
Joint Meeting with
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IFNRCON2026
Collaborators
Supporters
Technology Supported Rehabilitation: Current Scenario, Emerging Trends

Semantic Feature Analysis vs. Phonological Component Analysis: Effects on Naming and Generalization of Untrained Items in Aphasia

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Introduction: Word-finding difficulties are one of the significant features of aphasia (Goodglass & Wingfield, 1997). Various interventions that aim to improve the naming gains and generalization are developed based on the underlying principle that targeting a defective process can remediate that specific level of impairment. However there is poor understanding of which intervention method yields larger effects on naming gains on both treated and untreated items and generalization across different individuals undergoing the intervention independently.

Aim: The study aimed to understand the effectiveness of semantic feature analysis and phonological component analysis on naming gains and generalization to untrained items.

Method: A two-group experimental research design was conducted with four participants with Broca's aphasia with similar WAB scores. Two participants were randomly assigned to each of the intervention groups. 24 trained items from 6 categories were chosen as target stimuli from the ICMR- Manual for picture corpus. Six intervention sessions were provided to both groups, and post-PNT scores were collected. An untrained list (24 items) was also administered to find the generalization effect. Results: McNemar test revealed a significant improvement in naming gains in pre- and post-PNT scores and for trained items for the PCA group. Mann-Whitney U tests indicated no significant difference between PCA and SFA across the untrained items. Overall, PCA showed a slightly better performance compared to SFA, considering the small sample size (van Hees et al., 2019).

Conclusion: The study provides significant evidence comparing the two most commonly used aphasia interventions. It validates the importance of naming intervention

Prevalence of Peripheral Vestibular Dysfunction Among Young Adults: A Cross–Sectional Study Using the Dizziness Handicap Inventory (DHI)

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Introduction: Peripheral vestibular dysfunction (PVD) is a clinically significant yet often underrecognised condition associated with dizziness, imbalance, and disruptions in daily functioning. While dizziness research has predominantly focused on older adults, young adults represent a vulnerable and relatively overlooked population. Increased exposure to lifestyle and environmental risk factors—such as screen overuse, stress, poor sleep, and noise exposure—may predispose them to vestibular issues. Understanding the extent of dizziness handicap in this age group is essential for early identification and intervention.

Aim: To estimate the prevalence and severity of dizziness handicap indicative of peripheral vestibular dysfunction among young adults aged 18–25 years using the Dizziness Handicap Inventory (DHI).

Methodology: A cross-sectional study was conducted among 104 young adults between 18 and 25 years of age. Participants completed the standardized Dizziness Handicap Inventory (DHI). DHI scores were categorized as:

* Normal: <16
* Mild Handicap: 16–34
* Moderate Handicap: 36–52
* Severe Handicap: 54

Descriptive statistics were applied, and prevalence was calculated with 95% confidence intervals (CI).

Results: Among the 104 participants, 34.2% showed evidence of dizziness handicap (95% CI: 24.0–45.5). A majority (65.8%) scored within the Normal range. Among those with dizziness handicap:

* 19.0% exhibited Mild handicap
* 5.1% Moderate handicap
* 10.1% Severe handicap

Conclusion: Approximately one-third of young adults in this study demonstrated dizziness handicap, suggesting an emerging burden of peripheral vestibular dysfunction in this age group. Early screening in educational institutions, increased awareness of vestibular health, and timely intervention—including vestibular rehabilitation—may help reduce the functional impact of dizziness.

Factors Influencing Functional Recovery in Individuals with Moderate and Severe Traumatic Brain Injury

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Introduction: Traumatic Brain Injury (TBI) is a major cause of morbidity and mortality, especially in young adults. TBI can result in mild, moderate or severe injuries. Moderate to severe TBI results in significant sensorimotor and cognitive impairments. Recovery from these impairments and achieving functional independence is influenced by multiple factors. Understanding these factors is important for optimizing early rehabilitation.

Aim: To identify the factors influencing functional recovery in individuals with moderate and severe TBI at 3-months post injury.

Methodology: An observational cohort study is conducted for 63 adults (aged 18-65) with moderate to severe TBI (GCS 3-12), excluding those with medical instability, pre-existing neurological conditions, or recent spinal/limb fractures. Baseline assessments (5-7 days post-injury) included demographics and multiple scales including JFK Coma Recovery Scale-Revised, Ranchos Los Amigos Scale, Disability Rating Scale and assessment of sensorimotor status (voluntary movement, head control, sitting, and spasticity of major muscles). Participants continued their routine care. Functional recovery is measured via telephonic follow-up at 3 using Glasgow Outcome Scale-Extended and Functional Ambulation Category.

Results: After screening 54 individuals as of November 15, 2025, 16 participants with moderate/severe TBI are recruited (3 females, 13 males). Complete findings will be provided later. The study is ongoing.

Conclusion: This study may identify early prognostic factors for 3-month functional recovery in individuals with moderate to severe TBI, to guide rehabilitation strategies.

Effectiveness of Robot-Assisted Gait Training in Stroke Rehabilitation: An Umbrella Review

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Background: Robot-assisted gait training (RAGT) is widely promoted for post-stroke rehabilitation due to its potential to deliver intensive, precise, and high-repetition gait practice. However, the extent to which these theoretical advantages translate into superior clinical outcomes remains unclear. This umbrella review synthesizes evidence from systematic reviews to evaluate the empirical support for RAGT in stroke rehabilitation.

Methods: Systematic reviews and meta-analyses of randomized controlled trials involving adult stroke survivors were included if they compared RAGT with conventional physiotherapy, task-oriented gait training (TOGT), or no intervention. Outcomes of interest included walking independence, gait speed, endurance, balance, motor function, and quality of life. Review quality was appraised using AMSTAR 2, and overlap was quantified using a citation matrix and Corrected Covered Area (CCA).

Results: Eleven systematic reviews published between 2018 and 2024 were analyzed. After accounting for a CCA of 32.5%, approximately 223 unique RCTs with over 9,100 participants contributed data. RAGT produced modest yet meaningful improvements in walking independence (NNT 8), gait speed (0.06–0.10 m/s), balance (BBS + 3.5 to + 5.2), and endurance (6MWT +20–35 m). Benefits were most pronounced in subacute, non-ambulatory patients and were consistently observed only when RAGT was combined with conventional or task-oriented physiotherapy. No clear superiority was found over matched therapist-assisted gait training.

Conclusion: RAGT provides small but clinically relevant gains in post-stroke gait recovery, primarily as an adjunct

to established physiotherapy approaches. Its proposed mechanistic advantages do not independently ensure better outcomes.

Effect of Earlier Employment Profile on the Cognitive-Linguistic Abilities of Retired Women

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Background: Cognitive-linguistic abilities in older women are influenced by several factors, including occupational history. Occupations requiring higher levels of skill and mental effort contribute to cognitive reserve, supporting stronger cognitive-linguistic performance in later year s (Bajaj, G 2022). There is a particular need to understand how different vocational skill levels and the inclusion of unemployed women affect cognitive-linguistic functioning.

Aim: This study aimed to examine the effect of previous employment profile on the cognitive-linguistic abilities of women aged 60–70 years.

Methodology: Twenty participants were categorized into four groups based on their previous employment: three groups following the International Standard Classification of Occupations (ISCO-08) and one group comprising unemployed individuals. Detailed demographic information was collected, and the Cognitive Linguistic Assessment Protocol in Malayalam (CLAP-M) was administered to assess domains including attention, discrimination, perception, memory, organization, and overall cognitive-linguistic performance.

Results: Significant differences were observed between employment groups. Participants in the professional category outperformed other groups across all CLAP-M subdomains which was confirmed by the appropriate Statistical analysis The organization domain demonstrated the greatest sensitivity in identifying subtle cognitive differences across employm ent levels (Feldberg, C., Barreyro, J. P. et al., 2024). All groups showed similar abilities in selective attention and perception tasks.

Conclusion: High-skilled occupations appear to offer greater cognitive protection. These findings highlight the importance of lifelong cognitive engagement and underscore the relevance of considering previous employment status when planning interventions for conditions such as aphasia.

Immediate Effect of Epley's Maneuver on Perception of Verticality in Community Dwelling Elderly Population – An Experimental Study

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Introduction: The perception of verticality is integral to postural control and balance, relying on integrated input from visual, vestibular, and somatosensory systems. Aging leads to changes in vestibular structures causing imbalance and increased risk of falls in the elderly. The subjective visual vertical test assesses verticality perception and utricular function. Epley's maneuver is a recognized intervention to reposition displaced otoliths and improve vestibular function.

Aims: To determine the immediate effect of Epley's maneuver on the perception of verticality in community-dwelling elderly individuals.

Methodology: An experimental study conducted on 22 elderly subjects aged 60 to 75 years, community dwelling and scoring less than 15 on the Dizziness Handicapped Inventory (DHI) with SVV deviation greater than ±2°. Subjects underwent pre-test SVV measurement (bucket test), received right and left Epley's maneuvers, followed by immediate post-test SVV assessment. Purposive sampling was used, and subjects with neurological disorders or recent major surgeries were excluded. Statistical analysis used paired t-tests to compare pre and post SVV values.

Results: There was a statistically significant reduction in SVV deviation after Epley's maneuver (pretest mean 4.54 ± 1.4 degrees vs. posttest mean 1.22 ± 0.86 degrees, $p = 0.00013$). The calculated t-value (14.32) exceeded the critical t-value (1.72) at 21 degrees of freedom, indicating a significant immediate effect of the intervention on verticality perception.

Conclusion: Epley's maneuver produces a significant immediate improvement in the perception of verticality in the community-dwelling elderly population, suggesting its therapeutic benefit in addressing vestibular-related balance impairments in this group. References to dissertation data and methodss apply throughout.

Exploring Confrontation Verb Naming Ability Across Aging in Static and Dynamic Presentation Mode in Marathi-Speaking Adults

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Introduction: Verb retrieval, more demanding than noun retrieval (Bird et al., 2003), is affected in neurological conditions. However, studies on verb retrieval abilities for static and dynamic stimuli for healthy adults are limited.

Aim: To compare confrontation verb-naming ability across age groups in Marathi-speaking adults for static and dynamic stimuli.

Method: Static (line drawings, colored drawing, photograph) and dynamic (video) stimuli created for 24 familiar and imageable verbs, were validated by three SLPs. 66 adults in three groups, 20–40 years, 41–60 years, and 61+ years named each stimuli presented using PsychoPy software. Naming accuracy and response latency was documented.

Results: Kruskal–Wallis and Post hoc analysis indicated that there was no statistical difference between verb naming accuracy for the three age groups for dynamic stimuli ($p>0.05$). However, a significant difference was present between the youngest and oldest age group for all three static stimuli, indicating that confrontation verb naming abilities diminish gradually with ageing for two-dimensional images, irrespective of iconicity. Response latency was significantly more for the elderly for photographic images ($p = 0.005$) and line drawings ($p = 0.029$) as compared to the youngest age group. However, same was not seen for coloured images and dynamic mode of presentation.

Conclusion: Aging affects confrontation verb naming abilities, with older adults showing slower responses and reduced naming accuracy to static stimuli. However, this ability is undiminished for dynamic stimuli, highlighting the value of enriched visual contexts in supporting verb retrieval.

Keywords: aging, verb naming, static, dynamic, latency

Effect of Hand Grip Exercise by Using Hand Gripper on Hand Function in Healthy Geriatric Population

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Introduction: Aging reduces hand muscle strength, dexterity, and coordination, impairing daily activities and functional independence in older adults. These functional losses are due to degenerative changes in musculoskeletal, vascular, and nervous systems. Neurologically, aging involves loss of motor neurons, reduced nerve conduction velocity, decreased myelination, and diminished sensory input, all contributing to impaired motor control and hand function.

Aims: To evaluate the effect of hand grip exercise using a hand gripper on hand function, finger dexterity, and grip strength in healthy elderly individuals.

Methodology: An experimental study was conducted on 30 healthy elderly subjects aged 65–75 years, selected using purposive sampling. Baseline assessments included hand grip strength (using an aneroid sphygmomanometer), finger dexterity (using the 9-Hole Pegboard Test), and hand function (using the Duruoz Hand Index). Subjects performed hand grip exercises with a gripper (2 sets of 10 repetitions, thrice weekly) for three weeks. Post-intervention reassessment was conducted, and data were analyzed using paired t-test and Wilcoxon signed rank test.

Results: Significant improvements were observed post-intervention in grip strength, finger dexterity, and hand function for both dominant and non-dominant hands ($p < 0.05$). Improvements were greater in males and the dominant hand.

Conclusion: Hand grip exercises with a hand gripper effectively improve hand strength, dexterity, and function in healthy elderly individuals, potentially enhancing their independence and quality of life.

Added Effect of Chest Proprioceptive Neuromuscular Facilitation on Trunk Control in Children with Spastic Cerebral Palsy

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Introduction: Impaired trunk control is a primary functional limitation in children with Spastic Cerebral Palsy (SCP), significantly affecting balance, posture, and independence. This impairment necessitates specialized physiotherapy interventions aimed at core stability. The potential synergistic effect of techniques like Chest Proprioceptive Neuromuscular Facilitation (PNF), which focuses on respiratory mechanics and proximal proprioception, warrants investigation in this population.

Aim: This study aimed to determine the added effect of incorporating Chest PNF into conventional physiotherapy for improving trunk control in children diagnosed with Spastic Cerebral Palsy.

Methodology: A quasi-experimental study was conducted involving 20 children with SCP, aged 3 to 18 years. Participants were randomly allocated into two groups: a Control Group (Conventional Physiotherapy) and an Experimental Group (Conventional Physiotherapy with Chest PNF). Both groups underwent therapy for four weeks. Outcome measures used were Trunk Control Measurement Scale (TCMS) and Pediatric Reach Test (PRT).

Results: While both groups demonstrated improvements, statistical analysis showed that the Experimental Group exhibited a significantly greater mean increase in TCMS scores (0.0761) compared to the Control Group. Statistical difference was also noted for PRT in Sitting (0.0464) as well as Standing (0.0203). This result indicates a superior enhancement with adding Chest PNF to conventional physiotherapy for trunk control and functional performance.

Conclusion: The addition of Chest Proprioceptive Neuromuscular Facilitation provides a significant complementary benefit to conventional physiotherapy. This finding suggests Chest PNF is an effective and recommended intervention strategy for maximally enhancing trunk control and functional status in children with Spastic Cerebral Palsy.

Effect of Unsupervised Pelvic Floor Muscle Training on Urodynamic Profile Among Individuals with Neurogenic Bladder Following Spinal Cord Injury: A Pilot Randomized Controlled Trial

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Introduction: Spinal cord injury (SCI) often results in neurogenic bladder, increasing the risk of complications such as urinary tract infections and renal failure. Urodynamic studies (UDS) are crucial for assessing bladder and sphincter function and identifying risks for lower urinary tract dysfunction. Pelvic floor muscle training (PFMT) is a first-line intervention for bladder dysfunction, but limited evidence exists regarding its impact on specific urodynamic parameters in SCI.

Aim: To evaluate the effect of unsupervised PFMT on the urodynamic profile of individuals with neurogenic bladder following SCI.

Methodology: Twenty participants with neurogenic bladder after SCI who had recovered from spinal shock were included and randomly assigned to an intervention group (n = 10) receiving PFMT plus standard care, or a control group (n = 10) receiving standard care alone. Baseline assessments included UDS, the Neurogenic Bladder Symptom Score (NBSS), and the Overactive Bladder Symptom Score (OABSS). The intervention lasted three months with periodic follow-ups. Post-intervention data were collected using the same measures.

Results: Within-group analysis showed significant improvements in maximum flow rate, voided volume, voiding time, and NBSS domains in the intervention group. Between-group comparisons showed significant improvements only in voiding time ($p = 0.01$) and reductions in overactive bladder symptoms ($p = 0.01$) in the intervention group. Other urodynamic parameters did not differ significantly between groups.

Conclusion: Unsupervised PFMT improved voiding time and reduced overactive bladder symptoms in individuals with SCI-related neurogenic bladder. However, its overall effects on urodynamic parameters were limited, indicating that outcomes may vary individually and that supervised PFMT may yield more robust results.

Effects of Integrated Neurodevelopmental Treatment and Sensory Integration Approaches on Postural Control and Functional Participation in Children with Sensory Processing Disorders: A Case Series Study

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Introduction: Children attending mainstream schools who present with Sensory Processing Disorders (SPDs), including vestibular-bilateral integration challenges, modulation difficulties, and dyslexia, often demonstrate reduced postural control and limited participation in daily school activities. Neurodevelopmental Treatment (NDT) improves motor control and postural stability through guided movement strategies, while Sensory Integration (SI) therapy enhances sensory processing and adaptive responses. Combining these approaches may provide synergistic benefits.

Aim: To evaluate the effectiveness of a combined NDT and SI intervention on postural control and functional participation in school-aged children with SPD.

Methodology: Four school-going children aged 5–10 years with Sensory Processing Disorders (SPD) underwent an 8-week intervention with twice-weekly sessions combining NDT and SI. Postural control was measured using the Pediatric Balance Scale (PBS), and participation assessed via Goal Attainment Scaling (GAS) and caregiver reports. The Short Sensory Profile (SSP) served as a baseline assessment that identified the sensory systems affected, which then guided the development of a tailored treatment plan.

Results: Participants demonstrated significant improvements in PBS scores, indicating enhanced postural control. Individualized participation goals were attained with improved GAS scores, alongside positive caregiver-reported increases in engagement in daily and school-related activities. The combined approach was feasible and well-tolerated.

Conclusion: Integrating NDT and SI shows promising effects on improving postural control and participation in children with SPD, supporting a holistic, sensory-motor therapeutic approach. Larger controlled studies are needed to further validate these findings and optimize protocols.

Effect of the Tele-Assisted Home Exercise Program on Balance, Functional Mobility, and Quality of Life in Persons with Parkinson's Disease (Teleport-Pd): A Single-Blinded Randomized Controlled Trial

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Introduction: Persons with PD (PwPD) require long-term rehabilitation for maintenance of independence which is possible with telerehabilitation.

Aims: To compare the effect of a low-resource tele-assisted (smartphone videoconference-guided) home exercise program (HEP) and an unsupervised standard HEP on balance, functional mobility, and quality of life in PwPD.

Methodology: Participants were 76 PwPD between Hoehn & Yahr stages 1–3 who were randomly allocated to receive tele-assisted HEP (experimental) or unsupervised HEP (control). Both groups performed three weekly sessions on alternate days for 6 weeks. Each session lasted 45–60 minutes. Balance was evaluated using Berg Balance Scale (BBS) and Activities-specific Balance Confidence (ABC) scale. Functional mobility was measured using Timed-Up and Go (TUG) test and Five-Times Sit-To-Stand (FTSTS) test. Quality of life was assessed using the 8-item Parkinson's Disease Questionnaire (PDQ-8). All outcome measures were administered by a blinded-assessor at baseline, post-intervention (6-weeks), with follow-up at 1 and 3-months. All assessments and exercise sessions were performed during the on-state. Data were analysed using Linear Mixed Model in Jamovi.

Results: Between group comparisons for BBS, TUG, and PDQ-8 scores revealed significant improvement in the experimental group at all timepoints. ABC scores were significantly improved only at post-intervention. FTSTS scores were significantly improved only at the 1 and 3-months follow-up. Baseline values were a significant

covariate for all outcomes. Cognition and disease stage were significant covariates for functional mobility measures.

Conclusion: TELEPORT-PD was more effective than an unsupervised HEP in improving balance, functional mobility, and quality of life in PwPD.

Telehealth Approaches to Upper Limb Assessment in Stroke: A Comprehensive Mapping of Outcome Measures

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Introduction: Telehealth has become an important component of stroke rehabilitation, providing a practical way to assess upper limb function when in-person evaluation is limited. Several clinical outcome measures have been adapted for remote use, yet the available evidence is scattered across different studies. A clear understanding of these tools is needed to guide clinicians and researchers in selecting appropriate assessments for virtual care.

Aims: This scoping review aims to identify and describe the outcome measures used to remotely assess upper limb motor performance in individuals with stroke through synchronous or asynchronous videoconferencing.

Methodology: A systematic search was conducted in PubMed, Embase, CINAHL, Scopus, and ScienceDirect. Studies involving adult stroke survivors and reporting any remote upper limb assessment with feasibility, reliability, validity, or acceptability data were included. Key information about study design, assessment procedures, and outcome measures was extracted and summarized.

Results: Several outcome measures were identified, including video-based adaptations of established clinical tools such as the Fugl-Meyer Assessment for Upper Extremity and the Action Research Arm Test. Most studies supported the feasibility of remote assessments and provided early evidence of acceptable reliability and validity, though variations in methods and reporting were common.

Conclusion: Multiple outcome measures show promise for remote upper limb assessment after stroke. Further high-quality research is needed to strengthen evidence and support standardized telehealth assessment practices.

Efficacy of Internal Versus External Focus of Attention During Exercises on Postural Instability in Parkinson's Patients

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Introduction: Parkinson's disease (PD) is a chronic, progressive neurological disorder in which balance problems and postural instability significantly reduce quality of life. Falls are common, occurring in 35–90% of individuals with PD. Movement accuracy is strongly influenced by attentional focus during task execution. While internal focus directs attention to the performer's body movements, external focus directs attention to the movement's effect on the environment.

Aim: This study aimed to compare the effectiveness of four weeks of balance exercises using internal versus external focus of attention on the motor components of the Unified Parkinson's Disease Rating Scale (UPDRS) and the Multi-Directional Reach Test (MDRT). A secondary aim was to compare outcomes using the Fullerton Advanced Balance Scale (FABS).

Methodology: Twenty-seven medically diagnosed PD patients (Hoehn and Yahr stages 2–3) were included. Participants with systemic illness, other neurological conditions, or cognitive impairment (MoCA < 26) were excluded. Eligible patients were randomly assigned to Group A (internal focus) or Group B (external focus). Both groups underwent a 4–week intervention consisting of 30–minute postural stability exercise sessions, five times per week. Outcome measures were UPDRS motor components, MDRT, and FABS.

Results: Group B (external focus) demonstrated statistically significant improvements in UPDRS items related to Arising from Chair, Posture, Gait, and Postural Instability compared to Group A. MDRT scores showed superior Forward, Right, and Left Reach values in Group B. Only the external focus group showed significant post-treatment improvement on the FABS.

Optimizing Neurogenic Bladder Management in Spinal Cord Injury: A Retrospective Study From a Rehabilitation Perspective

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Introduction: Bladder dysfunction is common in spinal cord injury (SCI) patients, significantly affecting activities of daily living (ADL), quality of life (QOL), increasing caregiver strain and financial burden. Effective bladder management aims to preserve renal function, prevent infections, achieve continence, and improve QOL. Management strategies include clean intermittent catheterization (CIC), indwelling catheters, reflex voiding, and surgical options.

Aims: To evaluate clinical outcomes, patient compliance, barriers to bladder management in SCI patients undergoing neurorehabilitation.

Methods: A retrospective study was conducted at the Department of Physical Medicine and Rehabilitation, AIIMS Raebareli. SCI patients aged 18–70 years with neurogenic bladder were included. Data on demographics, injury profile, and bladder management methods were collected. Functional outcomes were assessed using the Functional Independence Measure (FIM) and Spinal Cord Independence Measure (SCIM). QOL evaluation using WHOQOL-BREF, and CIC-related challenges were assessed using the Intermittent Catheterization Difficulty Questionnaire (ICDQ).

Results: Among 34 patients (23 male, 11 female), 58.82% had traumatic and 41.18% non-traumatic SCI. Of 26 patients with indwelling catheters at admission, 18 transitioned to CIC successfully. On follow-up, 42.11% of CIC users voided independently with post-void residual <10 ml. FIM improved by 13.05%, sphincter control by 31.37%, and SCIM by 25.72%. WHOQOL-BREF scores improved in all four domains. ICDQ identified barriers-spasticity, poor upper limb function, recurrent UTIs, and inaccessible environments.

Conclusion: Neurogenic bladder management enables patients to improve their independence and ability to carry out activities of daily living. CIC proved to have better outcomes, QOL. Individualized training and support are essential for sustained adherence.

Telerehabilitation in Low– and Middle-Income Countries – A Scoping Review on Challenges, Solutions and Future Directions

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Introduction: Telerehabilitation (TR) has progressed by leaps and bounds since the COVID-19 pandemic. Recent publications on TR in low- to middle-income countries (LMICs) include its feasibility, cost-effectiveness, patient adherence and data security. Key challenges identified are the digital divide, socioeconomic factors, and lack of supportive infrastructure. Innovative solutions like asynchronous video-based therapy and low-cost models show promise for expanding access to rehabilitation services in LMICs.

Objective: To explore current telerehabilitation practices and implementation strategies in LMICs.

Methods: scoping review was conducted using keywords such as “telerehabilitation” AND “low to middle income countries” AND “challenges” AND “solutions”. Only studies from 2020 to 2025 were included in the review.

Results: Five studies were included in the review. TR in LMICs was used in neuromuscular disorders, chronic pain and COVID-19 infections; overcoming barriers to access such as cost, information technology (IT) infrastructure, cultural acceptance and shortage of professionals trained in TR. Home-based and/or hybrid TR models and mobile health (mHealth) using social media and free video conferencing platforms were more popular and provided better access in LMICs.

Conclusion: Low cost and culturally acceptable TR delivered through mHealth increase access to care in LMICs.

Keywords: Telerehabilitation, low to middle income countries, low cost, access, challenges, solutions

Effect of Supracondylar Knee Ankle Foot Orthosis on Posture in Children with Spastic Cerebral Palsy Having Knee Hyperextension and Ankle Equinus

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Introduction: Cerebral palsy (CP) involves posture and motor control disorders from a non-progressive lesion in the developing central nervous system. In Spastic CP, Genu recurvatum and equinus linked to muscle spasticity, weakness, postural issues, disrupts energy transfer and increasing consumption during movement.

Aim: The purpose of this study was to check the efficacy of bilateral customized SKAFO for knee hyperextension and heel rise for Cerebral palsy in terms of postural parameters.

Methodology: 30 children with spastic CP, aged up to 10 years, with knee hyperextension and ankle equinus deformity, were selected. By using supracondylar knee-ankle-foot orthosis (SKAFO), Pre- and post-data after 1 wee, including center of pressure (COP) path length (mm), area (mm^2), average velocity (mm/s), lateral deviation (mm), and antero-posterior deviation (mm) were collected using the PODIASTAT electronic sensor plate. Data were analyzed with SPSS software using paired t-tests.

Result: Mean antero-posterior deviation decreased from 41.74 ± 14.46 mm (barefoot) to 28.88 ± 16.13 mm (SKAFO) ($p = 0.04$). Latero-lateral deviation improved from 42.53 ± 18.67 mm to 27.65 ± 16.74 mm ($p = 0.03$). COP sway area reduced from 1441.17 ± 1115 mm^2 to 680.7 ± 580.2 mm^2. Mean COP path length dropped from 377.9 ± 204.7 mm to 230.2 ± 148.9 mm ($p = 0.02$). Sway velocity decreased from 13.47 ± 9.09 mm/s to 7.33 ± 3.89 mm/s ($p = 0.001$). These improvements, attributed to enhanced ankle stability and knee kinematics, confirm SKAFO's effectiveness in reducing postural sway.

Conclusion: SKAFO effectively reduced knee hyperextension, promoting stable, natural, and energy-efficient gait in spastic CP children with knee hyperextension and heel rise.

Immediate Effects of Electrical Stimulation on Serratus Anterior Muscle Activity in People with Hemiplegia-Post Stroke

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Background: Upper limb impairment occurs in approximately 80% of stroke survivors with altered scapular kinematics playing a key role in dysfunction. Serratus anterior weakness post-stroke contributes to abnormal scapular motion, limiting shoulder and arm function. This study explored whether electrical stimulation (ES) could immediately enhance serratus anterior activity in individuals with post-stroke hemiplegia.

Method: A pre-post intervention design was used involving 19 individuals within three months post-stroke. Surface electromyography (sEMG) recorded serratus anterior activity during a forward reach task. The Fugl-Meyer Assessment (FMA) was also administered. Participants received 20 minutes of ES targeting the serratus anterior, after which sEMG and FMA were reassessed.

Results: Wilcoxon signed rank test compared pre-and post-intervention sEMG values. Statistical analysis showed a significant change in the area under the curve value ($p < 0.01$) but no significant change in RMS value. There was no change in FMA scale.

Conclusion: Electrical stimulation showed significant changes in the muscle activity of serratus anterior indicating reduction in the cost of the muscle work done during forward reach task.

Keywords: Stroke, Serratus anterior, Electrical stimulation, Surface Electromyography

Ultrasound–Guided Scapular, Median and Ulnar Nerve Blocks in Comparison with Standard of Care in the Management of Shoulder Hand Syndrome: A Double Blinded Randomized Controlled Trial

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Background: Chronic Regional Pain Syndrome (CRPS) is a debilitating condition with pain disproportionate to the inciting event. Post-stroke upper limb CRPS is termed shoulder–hand syndrome. Cochrane review reports few published trials, mostly low quality, and hence not reliable. Among non-interventional therapies, graded motor imagery and mirror therapy show low-quality evidence for pain reduction.

Aim: To determine whether injections of 0.5% bupivacaine into the suprascapular, ulnar, and median nerves provide additional benefit compared to standard care for pain relief in CRPS.

Methods: Patients presenting to the PMR OPD between September 2020–2021 who met inclusion criteria were randomized by block randomization into control and intervention groups. Assessments included VAS, CRPS severity score, swelling index, and Fugl–Meyer at baseline, 1 week, and 2 weeks. Data were analyzed using the Wilcoxon signed-rank test.

Results: Twenty patients (10 per arm) were recruited. The primary outcome was VAS during joint movement. In the control group, median shoulder VAS decreased from 100 (77.5–100) to 50 (42.5–60), and hand VAS from 80 (55–100) to 40 (10–50). In the intervention group, shoulder VAS improved from 70 (50–100) to 35 (30–52.5), and hand VAS from 55 (50–80) to 30 (20–52.5). Between-group differences were not statistically significant ($p = 0.617$ for shoulder; $p = 0.568$ for hand).

Conclusion: Pain relief with nerve block is probably not more effective than standard of care alone.

Combination of Yoga and Physiotherapy in Home-Care Setting for a Patient with Parkinson's Disease: A Case Report

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Introduction: Parkinson's disease (PD) is a progressive neurodegenerative disorder of motor and non-motor symptoms. Physiotherapy plays role to reduce motor symptoms in PD. Research suggests that yoga improves mood related fluctuations, fatigue, sleep, flexibility and strength in PD. Functional limitations in PD reduce patient's adherence to therapy. This case study aimed to observe combined effect of physiotherapy and yoga for patient with PD in home care setting.

Case Scenario: A 78-year-old male diagnosed with moderate PD (Hehn & Yahr stage II–III) with bradykinesia, postural instability, reduced gait speed, and mild anxiety. He had fall history to his left walks with walker support.

Therapeutic Intervention: Physiotherapy and Yoga at patient's home care setting for 8 weeks.

Physiotherapy: Lee Silvermann Voice therapy (LSVT) BIG in sitting and standing, strengthening exercises, gait and balance training.

Yoga: Breathing, mind and body relaxation, joint movements, flexibility training. Sessions occurred for 45 minutes to 1 hour, twice weekly. Self home exercises practiced on remaining days.

Outcomes:
Unified Parkinson's Disease Rating scale (UPDRS): Changed from 44 to 33 out of 176.
Mini Balance evaluation systems test (Mini Best): No change.
Parkinson Anxiety Scale (PAS): Changed from 17 to 1 out of 44.
Parkinson Fatigue Scale: Changed from 3 to 2 out of 16.

Conclusion: Combined yoga and physiotherapy in home settings helped to reduce severity of PD, anxiety and fatigue. Future studies with more samples are required to understand the effect. Mixed therapy settings could be beneficial for training.

Physiological Response of Fear of Fall in Older Adults Through Motor Imagery Using Galvanic Skin Response: A Case-Control Study

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Introduction: Fear of Fall (FOF) is a multidimensional phenomenon that adversely affects the quality of life in older adults. Conventional assessment tools largely depend on subjective self-reports, lacking objective measures. Galvanic Skin Response (GSR), reflecting sympathetic nervous system activity, may provide an objective marker for FOF.

Aims: This study aimed to examine the association between FOF and GSR in older adults using motor imagery tasks.

Methodology: A case-control study was conducted with 38 older adults (19 with FOF, 19 without FOF) from Ramaiah Hospitals. Allocation was based on Fall Efficacy Scale–International (FES-I) scores. GSR was recorded during a Guided Motor Imagery Task (sitting) and an Anticipatory Motor Imagery Task (standing).

Results: Chi-square analysis revealed a significant association between FOF and GSR for sitting ($x^2 = 4.47$, $p = 0.03$) and standing tasks ($x^2 = 30.8$, $p < 0.001$). Spearman's correlation showed a moderate relationship between FOF and GSR during the standing task ($x^2 = 0.51$, $p < 0.01$. Mann-Whitney U test indicated significantly higher GSR in the FOF group during the standing task ($p < 0.001$).

Conclusion: FOF was significantly associated with sympathetic activation measured by GSR, with stronger responses during anticipatory motor imagery. GSR may serve as a valuable objective tool for assessing FOF in older adults.

Every Movement-Disorder Cannot Be Parkinson's: The Necessity to Re-Consider the Diagnosis & the Role of "Brainnext" Tools in Motor-Rehab

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Introduction: In INDIAN clinical-settings it is observed that the diagnosis of Parkinson's disease done within-minutes, without systematic-clinical-investigations. Clinical experience shows that any/every patient with movement-related-issues, cannot have Parkinsons-disease.

Total N= 22 patients pre-diagnosed with Idiopathic Parkinson's-disease had stroke in the Cerebellar and Pons-area, with neuro-imaging as clinical evidence, NOT considered before the diagnosis of Parkinson's disease. With "BrainNext" tools 6 to 9 months rehab program, reduced pharma interventions improved cognitive-motor conditions significantly.

Aims: This study aims to focus on re-considering clinical diagnosis of Parkinson's disease. N=22 patients visited clinic for "BrainNext" rehab program for motor & cognitive deficit between August'22 to January'25, diagnosed with Idiopathic Parkinson's disease under pharma-interventions, without clinical evidence with deteriorating neurological conditions. The neuro-imaging for N=22, found clinical evidence for Stroke in the Cerebellar and Pons areas causing motor-cognitive-deficit.

Materials & Methods: BrainNext" rehab tools for motor-memory-cognitive deficit, used for >6675 patients with varied-neurological conditions, since year 2015, with positive results.

The patients N=22, visited clinic for "BrainNext" rehab-program, pre-diagnosed with Idiopathic-Parkinson's disease under pharma interventions, without-systematic clinical investigations, neuroimaging established-evidence-of-stroke in the Cerebellar-and-Pons areas causing-significant-motor-deficit. With "BrainNext" rehab program the motor conditions improved, not requiring/significantly-reduced specific-Parkinson's-disease-pharma-interventions.

Results: N=22, pre-diagnosed with Idiopathic-Parkinson's-disease, were re-considered with-neuroimaging evidence of having-stroke-in-the-Cerebellar-and-Pons areas causing-motor-cognitive-impairment, were given

"BrainNext" rehab-program for motor-deficit, improving movements >65% from 0% baseline-condition within 6- to 9-months-duration.

Conclusion: It is time to re-consider-diagnosis-of-Idiopathic-Parkinson's-disease done-without systematic-clinical-investigation. The neuroimaging-evidence in N=22, established-the-history-of-stroke in the-Cerebellar-and-Pons area causing motor-cognitive issues, which-improved >65% from 0% baseline-condition-with the "BrainNext" tools-rehab-program, within-6-to-9-months-duration, not requiring/significantly-reduced specific-Parkinson's-disease-treatment.

Chronic Myoclonus in an Individual with Coup-Countercoup Injury with Functional Gait Impairment – A Rare Case Report

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Aim: To document a rare presentation of chronic myoclonus after traumatic brain injury and share the detailed account of patient's response to medical and rehabilitative management.

Methodology: A detailed history and clinical examination was done. A 20 year old male had accident 2 years back following which he had right fronto-parieto-temporal extradural hemorrhage and left parietal cortex countercoup lesion. He underwent evacuation post which he was on ventilator for 1 month and had multiple episodes of seizure. He remained non-ambulatory for 2 years due to sudden involuntary jerks and diplopia despite being on multiple anti- epileptic drugs. Intention myoclonus and orthostatic myoclonus was observed. Cerebellar signs were negative except nystagmus. EEG was normal. MRI showed cerebellar atrophy. Tablet clonazepam was given along with relaxation technique, balance and gait training. Scale for assessment and rating of ataxia (SARA) was noted at admission and at one week.

Results: SARA score improved from 15 to 5 in one week and patient attained independent gait.

Conclusion: Myoclonus is a rare complication after brain injury which can lead to functional gait impairment. Promt diagnosis and holistic treatment involving tablets like clonazepam and rehabilitative exercises can help to improve functional independence.

Acute Effects of Repetitive Peripheral Magnetic Stimulation on Swallowing Muscles: An Surface Electromyography (sEMG) Study in Healthy Adults

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Repetitive Peripheral Magnetic Stimulation (rPMS) is an emerging non-invasive neuromodulatory technique that uses magnetic field–mediated activation of peripheral nerves and muscles to modulate motor function. Unlike conventional electrical stimulation, rPMS can penetrate deeper neuromuscular structures painlessly, thereby enhancing motor unit recruitment and improving neuromuscular performance. Its application to swallowing musculature represents a novel approach to augmenting muscle activation and neural plasticity, potentially improving swallowing function. The present study aimed to investigate the immediate neuromuscular effects of rPMS on swallowing-related muscles in healthy individuals and to establish baseline data for a standardized stimulation protocol. Ten healthy adults (mean age 25.2 years) received rPMS (Remed Salus Talent Pro) over the suprahyoid region targeting the digastric, mylohyoid, geniohyoid, and stylohyoid muscles. Stimulation was administered for 5 minutes daily over five consecutive days at 30 Hz frequency, 3 seconds work-time, 6 seconds inter-train interval, and 18% intensity. Surface electromyography (sEMG) recordings (Chattanooga VitalStim) were obtained before and after each session during five water swallowing tasks to measure peak and average potentials. Results demonstrated a statistically significant increase in sEMG amplitudes, with a mean peak potential difference of 43.18 μV ($p = 0.0115$). No adverse effects were reported, confirming the short-term safety and tolerance of the protocol. This study provides preliminary evidence that short-duration rPMS applied to the suprahyoid muscles can acutely enhance swallowing-related muscle activity in healthy adults, highlighting its neuromodulatory potential and supporting further controlled trials to validate its clinical utility in dysphagia rehabilitation.

Leveraging Technology for Parkinson's Disease Rehabilitation: A Community-Based Model Across Age Groups from India

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Introduction: People with Parkinson's disease (PwP) often face barriers to consistent, multidisciplinary care. To overcome these challenges, the Parkinson's Disease and Movement Disorder Society (PDMDS), India, implemented a technology-driven rehabilitation model in 2020, ensuring continuity of care for both elderly and young-onset Parkinson's disease (YOPD) populations across community settings.

Aim: To describe the PDMDS multidisciplinary model (MDM) of care delivering structured, tech-enabled assessment, rehabilitation, caregiver support, and workforce training for Parkinson's care across age groups.

Methodology: The PDMDS-MDM integrates technology to assess and intervene in the physical, cognitive, and speech-related symptoms of Parkinson's disease.

Key initiatives include: Regular online sessions for PwP to promote exercise, communication, and psychosocial well-being.

Caregiver education and emotional support sessions to enhance home-based management.

WhatsApp-based assessments for individuals with limited mobility or digital access.

Initial and ongoing digital literacy training for PwP and caregivers, especially older adults.

YOPD sessions addressing work-life balance and early-stage management.

Continuous facilitator training to ensure program quality and uniformity.

Virtual collaborations extending the model to South Africa and Kenya.

Online educational webinars for public awareness.

Virtual student training programs for social work and allied health colleges across India.

Results: Since 2020, PsDMDS has delivered over 3,000 online sessions across 30+ regions in India. Continuous facilitator training has maintained program quality, while caregiver feedback highlights improved confidence and engagement in PwP management.

Conclusion: The PDMDS technology-enabled, community-driven model bridges Parkinson's care gaps across age groups, demonstrating that digital empowerment and collaborative training can create scalable, globally replicable solutions for holistic rehabilitation.

Reaching the Unreached with Technology: A Digital Journey to Raise Awareness and Promote Inclusion for People with Parkinson's in India

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Introduction: Parkinson's Disease (PD) awareness remains low across India, especially in rural and tribal regions where access to neurologists and rehabilitation services is limited. The Parkinson's Disease & Movement Disorder Society (PDMDS) recognized that overcoming this gap requires innovative, technology-driven strategies to educate and empower both the public and healthcare providers.

Aims: The aim of PDMDS is to educate the masses about Parkinson's Disease across India, leading to increased awareness, busting of myths, and promoting inclusion of people with Parkinson's (PwPs) in all aspects of life.

Methodology: Since 2019, various educational programs have been conducted by PDMDS using multiple technologies. Live and online training sessions were delivered via platforms such as Google Meet, Zoom, and Microsoft Teams. Digital learning materials — including infographics, educational videos, and handouts — were shared with diverse audiences, including healthcare professionals, healthcare workers, students, and the general population from urban, rural, and tribal areas.

Results: Through this PDMDS initiative, over 4,39,000 people were educated about Parkinson's Disease, its symptoms, and early identification methods. The programs also worked toward breaking myths and taboos, promoting inclusion of PwPs within their communities, and building awareness among healthcare networks nationwide.

Conclusion: The PDMDS technology-based education and outreach initiatives have proven to be powerful tools in spreading awareness about PD and promoting inclusion. This model demonstrates that digital connectivity can successfully bridge geographical and social gaps, ensuring that knowledge and acceptance reach even the most remote parts of India.

Development of a Feeding and Swallowing Screening Test for Indian Children (0–2 years): A Modified Delphi Study

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Background: Feeding problems in infancy and early childhood are multifactorial, influenced by physical, psychological, and environmental factors, as well as cultural feeding practices. In India, the absence of culturally relevant screening tools, limited parental awareness, and the tendency to prioritize other health conditions hinder early identification of feeding and swallowing difficulties.

Aim: To develop and validate a culturally appropriate screening tool for identifying feeding and swallowing difficulties in Indian children aged 0–2 years using the Modified Delphi method.

Method: A two-round Modified Delphi approach was employed for content validation. Unlike the traditional Delphi method, which begins with open-ended questions, the Modified Delphi uses predefined statements based on literature and clinical input. The expert panel comprised three speech-language pathologists, one pediatrician, and one neonatologist. An initial pool of 157 items spanning six age levels (0–24 months) was generated from literature on feeding milestones, clinical guidelines, and culturally specific Indian feeding practices. In Round 1, experts rated each item on a 5-point Likert scale across three domains: clinical relevance, clarity, and contextual importance. Items receiving >80% consensus in at least two domains and >60% in the third were retained. Based on feedback and revisions, Round 2 further refined and reduced items to form the final screening tool.

Results: The iterative process achieved strong expert consensus, ensuring the inclusion of clinically relevant, developmentally appropriate, and culturally grounded items.

Conclusion: The Modified Delphi method successfully produced a culturally sensitive, clinically valid screening tool for early identification of feeding and swallowing difficulties in Indian children.

Co-Creating Continence Care in Stroke: The Pelvic Floor Rehabilitation in Stroke (PFloRIS) Program for the Management of Urinary Incontinence in Women Stroke Survivors

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Introduction: Urinary Incontinence (UI) is a commonly seen yet underappreciated post-stroke complication. Co-designing is a strategy that embraces partnership with the community enabling listening to unheard voices. Co-creating a rehabilitation program along with women stroke survivors (WSS) will ensure population specific efficacy and stakeholder satisfaction.

Aims: To test feasibility and acceptability of implementing a co-created Pelvic Floor Rehabilitation in Stroke (PFloRIS) program for UI in WSS.

Methodology: The PFloRIS was developed along with five WSS suffering from UI. Following this, the program was pilot tested for six weeks using a pre-post intervention design. We included ten WSS suffering from UI. Effect of intervention was assessed using instruments such as surface electromyography and questionnaires such as International Consultation on Incontinence Questionnaire for Urinary Incontinence Short form (ICIQ-UI-SF), International Consultation on Incontinence Questionnaire for Female Lower Urinary Tract Symptoms Long-Form (ICIQ-FLUTS-LF), Incontinence Quality of Life (I-QOL) Scale and Modified Oxford Scale (MOS).

Results: Median age of participants was 67 years; median BMI 24.2 kg/m^2; and median duration post-stroke was 11 months. The ICIQ-UI-SF mean score decreased from 12.9 ± 6 at baseline to 8.3 ± 4.7 post-intervention indicating an improvement. Participants showed an improvement in ICIQ-FLUTS-LF as the mean scores decreased from 64.2 ± 17.1 to 39.5 ± 15.8. Mean scores of I-QOL increased from 68±11.8 to 77.7 ± 7.1 indicating an improvement. The average MOS score increased from 2 to 3 indicating significant improvement. No meaningful change was observed in the surface EMG scores.

Conclusion: The co-developed PFloRIS program showed good feasibility and acceptability in WSS suffering from UI.

Correlation Between Gait Speed and Movement Time of Upper Limb Tasks in Healthy Older Adults: A Cross Sectional Study

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Background: As one ages, there is a decrease in motor function, which impacts lower and upper limb movement. Gait speed is a long-established predictor of functional mobility, whereas movement time for the upper limbs has been used as a measure of fine motor control. Although they are measured independently, both require neuromotor coordination, suggesting a common underlying mechanism. Knowledge of the relationship between gait speed and upper limb movement time can be used to inform age-related motor change and direct rehabilitation. This study examines the association between these two measures in healthy older adults to determine their interdependence and implications for clinical measures.

Methods: Thirty healthy older adults were recruited from Ramaiah Hospitals. Gait speed was assessed with GAITRite, whereas upper limb movement time was analyzed with Kinovea software, evaluating tasks from the Fugl-Meyer Upper Limb Assessment. Spearman's correlation coefficient was applied to identify the relationship between gait speed and upper limb movement time.

Results: A moderate negative correlation was seen, with more rapid gait speeds linked with shorter upper limb movement times ($r = -0.44$, $p = 0.003$).

Conclusion: This research shows a moderate correlation between gait speed and upper limb movement time in older people, indicating a common neuromotor control mechanism. Prolonged upper limb task performance is related to slower gait speed, underscoring the significance of measuring both components of motor performance in clinical assessments. These results stress the need for physiotherapists to adopt a holistic approach by including gait and upper limb assessments in rehabilitation programs.

Augmentation of Neuropsychological Rehabilitation Using Generative AI: Reflections From a Tertiary Care Centre in India

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Introduction: Generative Artificial Intelligence (GenAI) models, such as OpenAI's ChatGPT and Google's Gemini, have rapidly transformed the landscape of technology and human–computer interaction since their public release in late 2022. Despite their omnipresence, little has been written about integrating these models into routine clinical care in the field of neuropsychological rehabilitation.

Aims: The current paper outlines the applications of GenAI in augmenting clinical practices within neuropsychological rehabilitation. Through case illustrations from a tertiary care centre in India, we demonstrate how GenAI can support clinicians and be integrated across rehabilitation mechanisms.

Discussion: In our experience, the clinical applications of GenAI can be broadly categorised into two main domains. First, GenAI demonstrates potential for direct cognitive retraining by generating personalised, adaptive stimuli tailored to a patient's sociocultural and educational background for drill-and-practice exercises. These have been used for targeting expressive language and executive functions. Second, GenAI has been used as an external aid to support activities of daily living by facilitating communication, planning/organisation, and learning. Each of these applications is illustrated through case excerpts of patients with varied neurological conditions from clinical practice in a tertiary care setting since October 2024.

Conclusion: Our preliminary experiences suggest that GenAI can meaningfully augment neuropsychological rehabilitation by enabling clinicians to deliver more personalised and adaptive interventions, while also facilitating the translation of treatment gains into improved quality of life for patients. However, substantial work remains to be done in empirically validating these applications and developing standardised clinical protocols to optimise their therapeutic potential.

Melodic Intonation Therapy in Patients with Left Hemisphere Stroke

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Introduction: One of the few accepted treatments for severe, non-Fluent Aphasia is Melodic Intonation therapy (MIT)–A Treatment that uses the musical elements of Speech (Melody And Rhythm) to improve expressive language by capitalizing on preserved function (Singing) and engaging language capable regions in the undamaged right hemisphere.

Aim of Study: To study the effect of Melodic Intonation Therapy om Left Hemisphere Stroke.

Methodology
Selection criteria:

- Patients with Unilateral Left Hemisphere Stroke.
- Poor Articulation.
- Non-Fluent or severely restricted Speech output.
- Moderately well-preserved auditory comprehension.
- Good Motivation, Emotional Stability and good attention span.

Five selected patients were given MIT for 20 sessions, 5 times a week.

Bedside Evaluation of Language for Individual Having Brain Damage was administered pre and post therapy in Hindi.

Results & Discussion: All 5 patients improved after MIT. Bedside Evaluation of Language for Individual Having Brain Damage revealed improvement in Object Recognition, following verbal instructions, Repetitions, Automatic speech, Yes – No answers to questions, sentence completion, naming, Verbal fluency.

After damage sustained by the dominant hemisphere, MIT may activate the auditory cortex corresponding to music processing in the Right brain and activate the Right brain language motor area corresponding to the Brocas area of the Left Brain through the conduction of the Right arcuate track to achieve compensation and guide the patient's language output to achieve the purpose of language communication.

Conclusion: MIT is effective and has positive results is improving language skills in patient with Left hemiphere stroke.

A Rare Case of HIV Neuropathy Presenting with Paraplegia and Neurogenic Bowel and Bladder

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Introduction: Various neuropathies have been associated with HIV; sensory neuropathy is common, and post-infectious polyneuropathy is quite rare. With the advent of ART, the incidence of HIV neuropathy has reduced. But individuals with low CD4 counts may develop polyradiculopathy secondary to infections like cytomegalovirus or syphilis.

Aim: To describe a rare case of progressive weakness of lower limbs with urinary and faecal incontinence, diagnosed with HIV and Treponema pallidum infection.

Method: A 17-year-old male with a history of sexual abuse and progressive difficulty in walking to make him bedbound. He had neurogenic bowel and bladder. There was no history of trauma. Physical examination revealed skin and penile lesions, trace motor activity and reduced tone in both lower limbs. The ankle jerk and knee jerk were diminished, and the right plantar response was extensor. Light touch, pin prick, and vibration sense were reduced in both lower limbs, with prominent distal involvement.

He was positive for HIV-1 with a CD4 count of 106 cells/mm^3 of blood. The Treponema pallidum haemagglutination test was positive. NCS showed reduced conduction velocity in bilateral tibial and peroneal nerves and absent SNAP in lower limbs. The MRI-spine was normal. ART and appropriate antibiotics for syphilis were started. After rehabilitation, significant motor recovery was achieved.

Results: He is ambulating with bilateral KAFO and walker.

Conclusion: Polyneuropathy secondary to syphilis in HIV patients may present as paraplegia and neurogenic bowel and bladder. Prompt diagnosis and treatment may prevent progression, improve function and can also be life-saving.

Language Recovery in Bilingual Aphasia Post Subtotal Atypical Meningioma Resection

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Introduction: Language impairment following brain tumor resection presents complex clinical challenges, particularly in bilingual individuals (Ahmad et al., 2024; Davie et al., 2008). Available literature on this condition is limited.

Aim: 1. Document linguistic abilities across languages (Malayalam/L1 and English/L2) post-neurosurgery/ radiation. 2. Evaluate the efficacy of an intensive therapy regimen on language recovery

Method: A 58-year-old bilingual male presented with reduced verbal output, reduced fluency, unclear speech and severe word-finding difficulty one-month post-subtotal meningioma excision. Formal assessments included the Frenchay Dysarthria Assessment (FDA, Enderby; 1983), Western Aphasia Battery (WAB, Kertesz; 1982), and Montreal Cognitive Assessment (MoCA, Ziad Nasreddine; 2005). The patient received a total dosage of eight 45-minute sessions of language therapy over three months. Structured therapeutic approaches such as Phonological Component Analysis (PCA), Semantic Feature Analysis (SFA), Verb Network Strengthening Therapy (VNeST), Spaced Retrieval Training (SRT), and Response Elaboration Training (RET) were used.

Results: WAB (December 2024) done in English and Malayalam revealed Resolving Broca's Aphasia with mild dysarthria. Naming was severely impaired (English: 18/100, Malayalam: 41/100), while auditory comprehension was relatively preserved, especially in L1 (Malayalam: 185/200). Significant gains were demonstrated post-therapy with improvement in semantic abilities, lexical fluency and language output (oral and written). Reassessment done after 8 sessions (February 2025) showed increased WAB scores across all language domains with better outcome in L1 in comparison to L2.

Conclusion: This case highlights the positive impact of intensive, targeted therapy in mitigating complex communication and cognitive deficits following neurosurgery. The distinct difference in recovery across L1 and L2, with.

Tech for Tomorrow's Health: Evaluating the Sustainability Footprint of Teleneurorehabilitation

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Introduction: Teleneurorehabilitation has grown quickly as a technology-based way to support people with neurological disorders. While its clinical benefits are well known, its role in sustainable healthcare within the UN 2030 Sustainable Development Goals (SDGs) is not fully understood. We need to evaluate its impact on the environment, economy, and society to shape future practices.

Aim: To assess the sustainability of tele neurorehabilitation in environmental, economic, and social areas.

Methodology: We searched PubMed and Google Scholar for studies published between 2015 and 2025. We used terms as telerehabilitation, teleneurorehabilitation, telehealth sustainability, remote rehabilitation, and digital health equity. Thirteen relevant articles were included, focusing on environmental impact, cost results, resource use, and accessibility. Data were synthesized thematically under environmental, economic, and social sustainability domains.

Results: Teleneurorehabilitation demonstrated a positive sustainability profile. Environmental advantages included lower carbon emissions due to less travel and reduced reliance on physical facilities. Economically, it provided cost savings from decreased transportation, time savings, and scalable digital platforms. Socially, it enhanced access for rural areas, people with mobility issues, and underserved communities, supporting SDG 3 and SDG 10. Challenges included differing levels of digital literacy, unreliable internet access, a lack of consistent tele-assessment protocols, and occasional dissatisfaction from patients and caregivers.

Conclusion: Teleneurorehabilitation plays an important role in sustainable healthcare by reducing environmental impact, improving cost-effectiveness, and promoting fair access. Strengthening digital infrastructure and creating standardized tele-based protocols will further improve its sustainability and scalability over time.

To Evaluate Use of Virtual and Augmented Based Technology on Balance Training in Neurological Patients

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Introduction: Despite advances in neurorehabilitation, balance dysfunction remains one of the most challenging impairments following stroke and Parkinson's disease (PD), often restricting independence and quality of life. Although conventional physiotherapy improves stability, there remains a need for interventions that enhance engagement and provide augmented feedback for motor relearning. Virtual Reality (VR)–based training provides a promising adjunct to conventional therapy by offering task-specific, multisensory feedback. Yet, research directly comparing its effects among diverse balance-impaired groups remains sparse.

Aim: To evaluate the effect of VR-based rehabilitation using the MindMotion GO (MMGO) system on balance outcomes among individuals with imbalance.

Methodology: This case series included nine participants divided into three groups: imbalance due to myelopathy (n = 3), stroke (n = 3), and PD (n = 3). Each underwent 8–10 supervised MMGO sessions of 30 minutes. Balance performance was assessed pre- and post-intervention using the Berg Balance Scale (BBS) and MMGO performance scores.

Results: Preliminary findings indicated a positive trend in BBS and non-compensatory MMGO performance scores. Participants reported high motivation and engagement throughout the training. Some were still undergoing intervention at the time of reporting.

Conclusion: VR-based training using the MMGO system appears to enhance balance and postural control in individuals with neurological and functional balance impairments. This case series supports the clinical feasibility of integrating immersive VR as an adjunct to conventional physiotherapy. Further studies with larger samples are recommended to validate these findings.

After Birth in Relation to Pass and Refer Rate in Neonatal Hearing Screening

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Objective: To verify and correlate the rate of refer in the neonatal hearing screening in relation to the time of life of the newborn when the procedure is carried out.

Methods: The study focused on babies born on a maternity, from January 2024 to April 2025. Newborns possessing one or more risk indicators for auditory impairment as described by the JCIH, 2007 or with time of life longer than 60 h were excluded. Babies were divided in three groups: GI: fewer than 24 h old, GII: between 24 and 36 h, and GIII: more than 36 h.

Results: 890 babies were included, 52% male and 48% female. Of all newborns, 70% passed the test and 30% failed. Regarding gender, 30% female and 31% male failed the test. 35% of the newborns were in GI, 53% in GII and 12% in GIII.

We noticed that in GII and GIII, the proportion of patients who presented de "pass" result is much higher than that of patients who presented this result in GI. The result of logistic regression shows that with the passing of each hour after birth, a newborn's chance of failing the test decreases by 5%.

Conclusion: We have concluded that the failure rate in the newborn hearing screening was much higher in the newborns screened within 24 h from birth, deviating statistically from the newborns screened between 24 and 36 h. There was no statistically significant difference between the latter two time brackets.

Physiotherapeutic Management of Neurogenic Bladder in Post Traumatic Spinal Cord Injury (SCI)

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Introduction: Neurogenic bladder is one of the major concern following traumatic SCI leading to Urinary tract infections and other serious complications. Conservative and multidisciplinary approach for neurogenic bladder may prove important to improve quality of life in these individuals.

Aim:

- To focus on rehabilitation of neurogenic bladder along with conventional neurophysiotherapy after traumatic SCI.
- To evaluate the effects of bladder rehabilitation on quality of life.

Methodology: A 53yr female had L1 burst compression fracture post fall causing conus compression and was treated with surgical stabilization. Conventional Neurophysiotherapy including strength, functional training, treadmill training and sensory retraining were done. After removal of foley's catheter post 6 months of injury, she joined her work with continuous diaper usage. We added bowel and bladder management techniques of timed voiding, pelvic floor muscle relaxation techniques, biofeedback, hips stretching, dietary modifications, sensory training and posterior tibial nerve stimulation. Pre and post assessment was done using ASIA scale, WISCI, Modified ashworth scale, digital rectal examination, Bladder diary, Post Void Residue (PVR), King's health questionnaire. Neurogenic bladder and bowel assessment was done.

Results: Our patient's ASIA changed from level B to C. WISCI changed from 9 to 12 (outdoor) and 15 (indoor). She is able to do timed voiding, uses diapers only during working hours infrequently and at night. King's health questionnaire shows a change of 20 points.

Conclusion: An evaluation with multidisciplinary team, structured approach and patient efforts and determination were found essential to manage neurogenic bladder after traumatic SCI.

Effect of a Wearable Vibration Based Neuromodulation Device on Freezing of Gait in Parkinson's Disease: A Randomized Controlled Trial

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Introduction: Freezing of gait (FOG) is a debilitating symptom of Parkinson's disease (PD), contributing to falls, loss of independence, and reduced quality of life. Current treatment offers limited benefits. Vibrotactile neuromodulation may modulate gait-related spinal circuitry, but clinical evidence remains limited.

Aim: To evaluate the efficacy of WALK, a wearable vibration-based neuromodulation device in reducing FOG severity and its effects on gait, balance, and non-motor outcomes in individuals with PD.

Methodology: 40 individuals with PD and FOG were randomized to an intervention group (active WALK n = 24) or control group (inactive device, n=16). Participants completed 16 sessions over six weeks. Assessments were conducted in the OFF-medication state at baseline (S0), session 8 (S8), and session 16 (S16), under both with- and without-WALK conditions. Primary outcomes were changes in FOG severity and performance across six FOG-provoking tasks under single- and dual-task conditions. Secondary outcomes included balance, mood, and autonomic function.

Results: The intervention group showed significant reductions in FOG severity at S8 and S16, with mean improvements exceeding the MCID (4.28 points). The greatest improvements occurred during narrow-space walking, turning, and dual-tasking ($p < 0.001$). Eight of twelve FOG-provoking activities exhibited state transitions (meaningful FOG profile shifts) and 58% (n = 14) achieved >2× MCID. Secondary outcomes were observed in Tinetti and COMPASS-31 scores in the intervention group. The control group improved in FOG severity only at S16, with no secondary outcome changes.

Conclusion: WALK produced sustained, meaningful reductions in FOG severity, especially during challenging tasks, supporting vibration-based neuromodulation as an effective PD intervention.

Diaphragmatic Facilitation vs Conventional Therapy: A USG-Based RCT in Chronic Stroke

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Background: Chronic stroke frequently leads to impaired respiratory muscle strength, reduced chest expansion, and compromised diaphragmatic function, contributing to decreased functional capacity and increased risk of pulmonary complications. Diaphragmatic facilitation techniques are proposed to enhance respiratory performance; however, their clinical effectiveness requires further investigation.

Purpose: To evaluate the effect of diaphragmatic facilitation techniques on respiratory muscle strength and diaphragmatic function in chronic stroke patients, using ultrasonography (USG) as a key assessment tool.

Methods: Sixty chronic stroke patients aged 30–60 years were randomly assigned to two groups. Group A received conventional therapy, while Group B received diaphragmatic facilitation techniques in addition to conventional therapy. Interventions were administered for 4 weeks, with three sessions per week. Outcomes measured at baseline and post-intervention included chest expansion, maximal inspiratory and expiratory pressures (Micro RPM), and diaphragmatic thickness/movement assessed using USG. Statistical analysis included the Shapiro–Wilk test, Wilcoxon paired test, and Mann–Whitney U test, with significance set at $p < 0.05$.

Results: Group A showed minimal or non-significant improvements in respiratory parameters. Group B demonstrated significant gains in chest expansion and both inspiratory and expiratory pressures ($p < 0.01$). Between-group comparisons showed superior post-treatment outcomes in Group B for chest expansion and inspiratory pressure. USG findings indicated functional improvement in diaphragmatic movement without major structural change.

Conclusion: Diaphragmatic facilitation techniques, when combined with conventional therapy, significantly improve respiratory muscle strength and functional respiratory outcomes in chronic stroke patients. Incorporating diaphragmatic facilitation into routine neurorehabilitation may enhance pulmonary function, trunk stability, and endurance, promoting better recovery.

Effect of Traditional Dysphagia Therapy and Neuromuscular Stimulation in Lateral Medullary Syndrome: A Case Study

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Introduction: Lateral Medullary Syndrome (LMS), is a neurological condition resulting from a stroke in the brainstem. Dysphagia in brainstem strokes is typically more severe than in hemispheric strokes. Early intervention is crucial and can reduce the risk of complications. This case study examines the combined use of traditional dysphagia therapy (TDT) and neuromuscular electrical stimulation (NMES) in treating dysphagia in a patient with LMS.

Aim: To evaluate the effectiveness of combining TDT and NMES in improving swallowing function in a patient with dysphagia following lateral medullary syndrome.

Methodology: A 45-year-old female patient with LMS was assessed for swallowing difficulties. Treatment included 10 sessions of NMES, alongside traditional therapy focused on lingual strengthening and laryngeal adduction-elevation exercises. Electrical stimulation was applied using a Biotech Striker Portable Muscle Stimulator, and therapy was conducted on alternate days for 6 weeks. Functional Oral Intake Scale (FOIS) and Eating Assessment Tool (EAT-10) were used to assess progress.

Results: After 6 sessions, hyolaryngeal excursion improved by 50%. By 6 weeks and 15 sessions, the patient regained full hyolaryngeal excursion and could swallow safely across all food consistencies (FOIS level 7), without any clinical signs of laryngeal penetration or aspiration. The EAT-10 score reduced from 33 to 4. Nasogastric tube was removed. Follow-up after 6 months showed no swallowing deficits.

Conclusion: Combined TDT and NMES significantly improved swallowing function in a patient with LMS. Early intervention with this approach led to faster and more complete recovery. Further studies with larger cohorts are needed to confirm these findings.

Development and Feasibility of a Contextualized Continuum of Care (CCoC) Model for Traumatic Brain Injury Survivors: A Protocol Study

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Introduction: Traumatic Brain Injury (TBI) is a leading cause of long-term disability worldwide, with a disproportionately higher burden in low- and middle-income countries (LMICs). Survivors experience persistent motor, cognitive, behavioural, and psychosocial challenges that require long-term, coordinated rehabilitation. In India, structured post-discharge rehabilitation remains limited, with only 0.4% of patients accessing rehabilitation compared to 16.3% in Europe. Existing Continuum of Care (CoC) models are fragmented and inadequately address the contextual realities of LMICs. There is a lack of structured, integrated CoC models that incorporate caregiver participation, community-based rehabilitation, and interprofessional collaboration within an evidence-based framework tailored to LMICs.

Aim: To develop a Contextualized Continuum of Care(CCoC)Model for moderate to severe Traumatic Brain Injury survivors and assess its feasibility.

Methodology: The study comprises three phases. Phase 1 explores the perspectives of healthcare professionals, survivors, and caregivers through focus group discussions and interviews on barriers, needs, and strategies for CoC. Phase 2 focuses on developing the model using a participatory Delphi process and workshops to integrate expert consensus and user perspectives. Phase 3 will evaluate the feasibility of implementing the model over six months, using the RE-AIM framework to assess reach, effectiveness, adoption, implementation, and maintenance within a community setting.

Results: The proposed model is expected to improve coordination, accessibility, and inclusivity across post-discharge care and rehabilitation.

Conclusion: If found feasible, the CCoC model could inform sustainable, culturally relevant, and integrated long-term care pathways for TBI survivors in resource-limited settings.

Keywords: Traumatic Brain Injury, head injury, continuum of care, community-reintegration

Factors Influencing Pelvic Floor Muscle Activation in Community Dwelling Women Stroke Survivors with Urinary Incontinence

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Introduction: Urinary incontinence affects up to 44% of post-stroke survivors and is consistently underrecognized, especially in women. Stroke frequently disrupts the sensation, coordination, and function of pelvic floor muscles, leading to their decreased strength and activation, which further exacerbates incontinence symptoms. However, studies specifically evaluating pelvic floor muscle strength and activation in women stroke survivors with urinary incontinence remain limited, highlighting a critical gap in current rehabilitation research

Aim: To identify the factors influencing pelvic floor muscle activation in community-dwelling women stroke survivors with urinary incontinence.

Methodology: A Cross-sectional observational study is conducted for community-dwelling women stroke survivors. Women more than one-month post-stroke with functional communication were included, while those with pre-stroke incontinence, history of pelvic surgery, other neurological disorders, or medications affecting bladder function were excluded. Pelvic floor strength (Modified Oxford scale), muscle activation (Electromyography), lower limb motor function (Fugl-Meyer), trunk control (Trunk impairment scale), and depression (Patient Health Questionnaire-9) were assessed.

Results: 16 of 60 planned women (median age 72 years) have been recruited; their median (IQR) Fugl-Meyer lower extremity score was 22 (17,30), trunk impairment score 16 (8,20) and depression score 7 (2,12). Pelvic floor muscle activation of 26.7 V (15,36) and strength 1(1.5,2) indicate substantial physical and pelvic floor muscle impairment.

Conclusion: Preliminary results indicate reduction in pelvic floor strength and activation in community dwelling women stroke survivors with urinary incontinence. The

factors identified from this study can guide professionals targeting pelvic floor rehabilitation in women with stroke to improve continence and participation in daily life.

An Occupational Therapy Focused Content Analysis of Stroke Home Programs

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Introduction: Stroke home programs (SHPs) include activities given to stroke patients and their caregivers to facilitate continued rehabilitation in their homes without the therapist or under supervision via telerehabilitation. Occupational therapists (OTs) usually provide activities of daily living (ADLs) in SHPs. However, a lack of standardized guidelines and contextually-relevant resources makes it challenging to deliver ADL focused SHPs, which impedes recovery. Developing such resources necessitates the understanding of existing materials.

Aim: To analyze the contents of available SHPs and assess the extent to which they are ADL focused.

Methodology: A qualitative study was conducted on SHPs available online and offline. Fifty hospitals were approached, of which five hospitals responded. Only one hospital provided their data. Freely available online SHPs targeted at patients and caregivers were collected. The data was analyzed by content analysis method using an a priori coding scheme.

Results: Eighteen SHPs were analyzed. Physical exercises appeared most frequently representing 25% of the SHP contents. ADLs like dressing, toileting, eating, bathing, and grooming appeared the least accounting for 1–4% of content. Caregiver education constituted 6.2% while caregiver well-being constituted only 3.9% of the contents. Most SHPs prescribed activities as exercises rather than meaningful occupation-based tasks. Supportive features like adherence monitoring and dosage instructions were presented inconsistently. Sections with goal setting, routine building, and directions to purchase equipment were minimal.

Conclusion: The findings indicate a predominant focus on preparatory activities and physical exercises. ADLs and caregiver directed contents are limited. Many SHPs have inconsistent structure and lack occupationally-relevant elements.

Dual-Cycle High- and Low-Frequency rTMS to Enhance Cognitive and Motor Recovery After Severe Hypoxic Brain Injury: A Single Case Study

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Introduction: Hypoxic brain injury after prolonged CPR is associated with extensive cortical dysfunction, impaired consciousness, and poor functional prognosis. rTMS offers frequency-dependent neuromodulation capable of altering cortical excitability and fostering neurobehavioral recovery.

Aims: To evaluate the domain-specific effects of a dual-frequency rTMS paradigm on cognitive–arousal mechanisms and motor initiation in severe post-hypoxic brain injury.

Methodology: A 55-year-old male with a hypoxic–ischemic insult secondary to 23 minutes of CPR post-CVA underwent stwo sequential rTMS cycles within a structured neurorehabilitation framework.

- **Cycle 1:** High-frequency 18 Hz stimulation (120% MT; 1980 pulses) over left DLPFC to upregulate frontal network excitability and enhance arousal, attention, and awareness.
- **Cycle 2:** Low-frequency 1 Hz stimulation (110% MT; 800 pulses) using the stroke protocol to downregulate hyperexcitability, mitigate spasticity, and facilitate motor system recruitment. Clinical effects were evaluated via functional communication, attentional capacity, command following, motor initiation, and mobility performance.

Results: Post-intervention, the patient demonstrated improvements characteristic of both excitatory and inhibitory rTMS mechanisms: emergence of structured verbal output using AAC, enhanced receptive comprehension, improved temporal and spatial orientation, naming and recognition gains, and sustained attention extending to 5–15 minutes. Motor recovery included regained trunk/neck control, volitional limb activation, assisted ambulation, and stair climbing ability.

Conclusion: Dual-frequency rTMS yielded multi-domain neurobehavioral improvements, suggesting synergistic benefits of sequential excitatory and inhibitory neuromodulation. This case underscores the clinical relevance of phase-specific rTMS integration in hypoxic brain injury rehabilitation.

Effect of Technology-Based Trunk Training Versus Conventional Therapy on Trunk Recovery in Acute Stroke: A Pilot Randomized Controlled Trial

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Introduction: Impaired trunk control early after stroke limits balance, independence, and recovery. While conventional physiotherapy helps, technology with real-time visual feedback may enhance engagement and motor learning, accelerating trunk improvement. Limited evidence exists for such technology-based training within the first week post-stroke, highlighting the need for further study.

Aims: To compare trunk recovery rates between technology-based and conventional training in acute stroke survivors.

Methodology: A single-blinded pilot RCT is underway involving 10 participants (18–85 years) with first-onset stroke (48 hours–7 days), poor trunk control, and the ability to follow commands. Participants were randomly assigned to either control or intervention group. The control group received standard exercises plus mat-based trunk training, while the intervention group received standard exercises plus technology-assisted trunk training with real-time visual feedback using the BTrackS™ system. Interventions were provided for 5 consecutive days. Trunk Impairment Scale and Function in Sitting Test—were assessed at baseline and after each daily session. Feasibility was evaluated through recruitment rate, adherence, safety, and participant engagement.

Results: Preliminary demographics show a mean age of 67 years, mean stroke-onset duration of 3.5 days, male: female ratio of 6:4 and ischemic: haemorrhagic ratio of 7:3. Early findings indicate that the intervention group demonstrates a faster rate of recovery, improving approximately two days earlier than the control group. No adverse events have been reported.

Conclusion: Preliminary results indicate faster rate of trunk recovery with Technology-Based Trunk Training and is feasible in the acute stage of stroke, supporting progression to a larger-scale clinical trial.

Correlation Between Manual Ability and Upper Arm Function, Hand Movement, and Advanced Hand Movement for Dominant and Non-Dominant Hand Affection in Chronic (MCA) Stroke Patients

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Introduction: Stroke, a major cause of death and disability, affects 700,000 Americans yearly. Ischemic middle cerebral artery occlusion often causes upper limb deficits. Despite rehabilitation, 70% retain impairments, with dominant hand involvement complicating recovery due to disrupted pyramidal tract and lost motor advantages. The need is to find associations between hand dominance, manual ability, and impairments in arm function, movements, grip strength, and cognition.

Aims: To investigate the correlation between Manual Ability and Upper Arm Function, Hand Movement, and Advanced Hand Movement for Dominant and Non-Dominant Hand Affection in Chronic (MCA) Stroke Patients.

Methodology: This experimental study included 30 subjects aged > 45 years and diagnosed with MCA pathology for 1 year and not more than 4 year with unilateral stroke, right hand dominance. Assessment was taken using general evaluation performa and outcome measures i.e. ABILHAND and MOTOR ASSESSMENT SCALE. Spearman's rank correlation coefficient was used to find correlation between dominant and non-dominant side impairments. Rasch analysis was used for ABILHAND scale.

Results: Analysis showed that the mean values of ABILHAND manual ability, Upper arm function, Hand movement, and Advance hand movement are significantly greater in right hemiplegics than left hemiplegics.

Conclusion: There is a significant impact of hand dominance over the performance of upper arm function, hand movement, advance hand movement. The manual ability is shown to have positive correlations with upper arm function, hand movement, and advance hand movement, in chronic stroke individuals.

Keywords: Manual ability, Hand dominance, Chronic MCA stroke, Upper arm function

Ultrasound-Guided Phenol Neurolysis for Spasticity Management: A Retro-Prospective Observational Study

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Introduction: Spasticity commonly follows upper motor neuron injuries and significantly impairs movement, function, and rehabilitation outcomes. Although phenol neurolysis is an established, cost-effective treatment option, high-quality Indian data using ultrasound guidance are limited. This study aims to evaluate the effectiveness and safety of ultrasound-guided phenol nerve blocks in reducing spasticity and improving functional outcomes in adults with MAS grade 2 spasticity.

Materials and Methods: This retro-prospective observational study will be conducted at the Centre for Physical Medicine & Rehabilitation, Kokilaben Dhirubhai Ambani Hospital, Mumbai. A total of 40 adult patients (18–80 years) with spasticity MAS 2 will be included. Retrospective data will be extracted from institutional medical records, and prospective participants will be assessed following informed consent. Outcome measures will include the Modified Ashworth Scale (MAS), Tardieu Scale, range of motion (ROM), and Goal Attainment Scale (GAS), assessed at four time points: pre-procedure, immediately post-procedure, 1 month, and 3 months. Functional assessments using the Disability Assessment Scale (DAS) for upper limbs and the Functional Ambulation Category (FAC) for lower limbs will be recorded at baseline, 1 month, and 3 months. Adverse effects will be monitored throughout. Data will be analyzed using SPSS with appropriate parametric or non-parametric tests and Bonferroni correction for multiple comparisons.

Results: As this is an ongoing protocol, results are not yet available. The study will generate structured, longitudinal data evaluating tone reduction, ROM changes, goal achievement, functional improvement, and adverse event frequency associated with ultrasound-guided phenol neurolysis.

Discussion: Findings from this study are expected to address.

Effectiveness of Ultrasound – Guided Periradicular Injection for Cervical Radicular Pain – A Retro – Prospective Study

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Background: Ultrasound-guided cervical periradicular injection is a relatively newer interventional technique for cervical radiculopathy. It offers the advantage of real-time visualization with no radiation exposure, making it a safer alternative to fluoroscopy-guided procedures.

Aim: To evaluate the effectiveness of ultrasound-guided cervical periradicular injections in reducing pain and improving quality of life and disability in patients with cervical radicular pain.

Methods: A retro-prospective study was conducted in patients with clinically and radiologically confirmed cervical radiculopathy who underwent ultrasound-guided cervical periradicular injection. Pain was assessed using the Numerical Rating Scale (NRS) at baseline, immediate post-procedure, 4 weeks, and 3 months. Quality of life was measured using SF-8, and disability using the Neck Disability Index (NDI) at baseline and 3 months.

Results: A significant reduction in pain was observed immediately after the procedure, with mean NRS decreasing from 7.65 (SD 0.91) to 4.02 (SD 1.42) ($t = 19.642$, $p = 0.000$). SF-8 scores improved from 35.58 (SD 9.94) to 54.97 (SD 10.02) at 3-months ($t = -19.440$, $p = 0.000$). NDI also showed notable improvement from 40.40 (SD 10.25) to 20.94 (SD 11.07) ($t = 13.666$, $p = 0.000$).

Discussion: The significant reduction in pain, alongside improvement in quality of life and disability at 3 months, reflects the clinical benefit of ultrasound-guided periradicular injection. As a radiation-free technique with direct visualization of neurovascular structures, it offers improved patient safety and procedural precision. The results align with emerging evidence supporting ultrasound as an alternative to fluoroscopy in cervical radicular interventions. However, the small.

Adherence to Developmentally Supportive Care: A Memory-Based Approach vs. A Mobile App-Based Approach

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Introduction: Recent advancements in global neonatal care prioritize intact neurological outcomes, yet cognitive (16.9%) and motor (20.6%) impairments are prevalent among very low birth weight and very preterm neonates. Developmentally Supportive Care, including healing environments, family-centered care, proper positioning, protected sleep, and stress reduction, is crucial for neuroprotection. However, consistent implementation in NICUs remains challenging due to knowledge gaps and lack of standardized protocols. The "INDIA EBUS" app, a validated cloud- based decision support tool, integrates neurophysiological, neurobehavioral, and occupational therapy interventions to guide individualised Neuro protective care.

Aim: This study aimed to evaluate adherence to DSC by NICU professionals working from memory compared to those utilizing the INDIA EBUS decision support tool.

Objective: The primary objective was to compare the completeness of DSC practices after training with the INDIA EBUS app in professionals providing developmentally supportive care to stable NICU preterm neonates. The secondary objective was to assess barriers and facilitators for providing DSC.

Methodology: A 6-month prospective observational pilot study involved 25 NICU professionals (10 doctors, 5 nurses, 10 occupational therapists). Participants' adherence to DSC guidelines was assessed via questionnaires and document review both before and after receiving 5 hours of training on the INDIA EBUS app.

Results: All 25 participants completed pre- and post-tests. Overall, a significant 50% increase in correct responses was observed post-training, with nurses showing the highest improvement (up to 80%). Twenty-three of 25 participants adopted newer developmentally supportive practices. Key facilitators included a bedside ready reckoner and organized activity listings.

Myocarditis as a Rare Complication in a Patient with Recurrent GBS During Inpatient Rehabilitation & Management: A Case Report

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Introduction: Guillain–Barré Syndrome (GBS) is typically monophasic, though 1–6% experience recurrence. Recurrence after more than a decade, especially in the axonal subtype is uncommon. Autonomic involvement is well known with cardiac manifestations ranging from dysautonomia to rare acute myocarditis.

Case Report: A 41-year-old woman presented with hyper-acute paraesthesia and rapidly progressive quadriparesis (proximal to distal) accompanied by dysphagia and hoarseness. No antecedent infection was identified. She had a previous GBS episode 17 years earlier requiring prolonged tracheostomy with near-complete recovery except mild dorsiflexor weakness. Current nerve conduction studies showed pure motor axonal neuropathy (AMAN) with strongly positive antiganglioside antibodies. She developed acute hypercapnic respiratory failure requiring intubation and underwent five cycles of plasma exchange. Following extubation, inpatient rehabilitation began. On day 74 of illness, she developed chest pain with tachycardia and hypotension. ECG showed sinus tachycardia with non specific changes. Serum Troponin-T was elevated and echocardiography supported a diagnosis of myocarditis.

Discussion: Rehabilitation focused on upper and lower-limb PROM, trunk and pelvic control, sitting balance and respiratory training. Speech therapy addressed bulbar dysfunction. She achieved unsupported sitting, improved trunk stability and early bulbar recovery. After the diagnosis of myocarditis, steroids were initiated by cardiology with subsequent clinical stabilisation.

Conclusion: This case highlights a rare combination of recurrent AMAN variant GBS, craniobulbar involvement, and myocarditis 17 years after the initial episode. Early multidisciplinary rehabilitation with vigilant autonomic and cardiac monitoring is essential to optimise prognosis and prevent potentially life-threatening complications.

Rehabilitation Challenges in a High Cervical Spinal Cord Injury Following Trivial Trauma and Complex Stabilization in Ankylosing Spondylitis: A Case Report

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Introduction: Ankylosing spondylitis (AS) causes altered spinal biomechanics, predisposing patients to highly unstable catastrophic fractures even after trivial trauma. Rehabilitation in this population is challenging due to marked spinal rigidity and hip involvement.

Case report: A 50-year-old man, following trivial trauma developed tetraplegia with bladder and bowel involvement. Imaging showed Grade IV C6–C7 anterolisthesis. Cervical traction failed, and he underwent long-segment 360° anterior and posterior fixation. On transfer to rehabilitation, he had markedly restricted cervical and dorsolumbar mobility and limited bilateral hip ROM. History revealed a prior diagnosis of AS previously managed with DMARDs, discontinued six years earlier. Whole-spine and pelvic radiographs confirmed advanced AS.

Discussion: This case demonstrates the vulnerability of the ankylosed spine, where minor trauma can produce unstable cervical fractures and severe SCI. Early multidisciplinary rehabilitation targeted pain and stiffness management with NSAIDs and muscle relaxants, lower-limb passive ROM, deep-breathing exercises, upper-limb strengthening, and ADL retraining. The patient developed infective atelectasis, common in high cervical injuries and was treated with intravenous antibiotics and intensified pulmonary rehabilitation. Rheumatology advised initiation of biological therapy for long-term disease control. Despite persistent ASIA B status, he showed early gains in sitting tolerance and dynamic trunk control. He continues inpatient rehabilitation and is expected to show further functional and neurological improvement during his admission.

Conclusion: Trivial trauma can result in devastating cervical SCI in patients with AS. Comprehensive, early, and coordinated multidisciplinary rehabilitation is is essential in optimization of outcomes following complex 360° anterior–posterior stabilization in a completely ankylosed spine.

Outcome of a Unique Case of Neglected Paediatric Head Injury: A 6 Month Follow-up of Individualized Intensive Physiotherapy Care

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Background: In infants under one-year due to parental neglection or abuse may lead to falls from bed, causing blunt head trauma due to direct skull impact. It causes damage in brain making the child unable to perform gross and fine motor activities,delay in developmental milestones. Rehabilitation of such pediatric head injury results in neglect from the family leading to progression of complications.

Aim: To evaluate the rehabilitation outcome in a case of neglected pediatric head injury through individualized intensive physiotherapy over a 6-month follow-up period.

Case-Description: A case of five-year-old boy who was diagnosed with pediatric head injury at age of 11 months presented with symptoms of seizures, spasticity grade 3, delayed milestones. The grandparent gave us the history, complaints of child being bedridden and unable to perform any activities rolling, crawling, sitting or standing.

Method: The individualized intensive therapy focused on Task-oriented therapy three times per week for about 90 minutes/session based on specific goals. The intensive therapy included play-based activities based on task-oriented approach.

Result: After 6 months of rehabilitation, outcomes measured with the GMFM and Modified Ashworth Scale showed improvement in lying and rolling to 49%, sitting to 36%, and crawling and kneeling to 30% and Spasticity reduced from grade 3 to grade 1 respectively.

Conclusion: This case study concludes that intensive task-oriented training plays an important role in improving ability to perform rolling, crawling, sitting, standing activities. Also shows significant role in reducing the level of spasticity.

Keywords: Task-oriented therapy, Spasticity, GMFM, pediatric head injury

Knowledge, Attitude, Perception, and Practice of Prediction Model Related to Stroke Motor Recovery Among Physiotherapists in India: A Survey

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Introduction: Prediction models for stroke motor recovery have become increasingly important for guiding rehabilitation decisions, setting realistic goals, and improving treatment outcomes. Despite their value, the level of awareness and use of such models among physiotherapists in India remains unclear. Understanding their knowledge, attitude, perception, and clinical practice in this area is essential to strengthening evidence-based stroke rehabilitation.

Aim: The study aims to identify the knowledge, attitude, perception, and current clinical practice related to prediction models for stroke motor recovery among physiotherapists in India.

Methodology: A cross-sectional online survey will be conducted among physiotherapists across India. A structured questionnaire was designed based on existing literature and reviewed by experts to ensure content validity. The questionnaire explores participants' understanding of prediction models, their perceived usefulness, their attitudes toward integrating predictive tools in clinical decision-making, and their current practice patterns. The questionnaire will be circulated through academic institutions and professional networks such as physiotherapy associations. Data will be analysed using descriptive statistics and appropriate inferential tests to examine associations between demographic variables and responses. The Institutional Ethics Committee (IEC) approval process is currently underway, and data collection will commence once approval is obtained. Results: The study will report respondent characteristics and describe their knowledge levels, attitudes, perceived facilitators and barriers, and adoption of prediction models. Differences based on qualifications, experience, and work settings will also be analysed.

Conclusion: This survey is expected to highlight existing gaps in the understanding and use of prediction models for stroke motor recovery among physiotherapists in India.

A Pilot Study: Measuring the Effect of Dual Task Gait Training on Gait Speed in Individuals with Chronic Stroke. A Pre-post Intervention Study Using the 10 Meter Walk Test

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Introduction: It is hypothesized that dual-task gait training may improve walking ability in individuals with chronic stroke, enhancing motor control

Aims: The aim of the study was to evaluate the effectiveness of a structed 2 -week dual task gait training program on single task walking speed in chronic stroke patients.

Methodology: Using a single group pre-test/post-test design in an outpatient neurological rehabilitation setting, 11 participants aged 45–75, years 6 months post stroke participated in the study. Seven of these completed the protocol. All were put through 6 sessions of a verbal dual task during gait training, over a period of two weeks. The dual task protocol was standardized and with increasing difficulty at each session. All patients had MMSE scores of 24/30 and were independent community or indoor ambulators with or without assistive devices. Assistive device if being used was kept consistent during the pre- test, the training and the post -test.

Results: Overall positive gains were noted in gait speed. Improvements ranging from 4% to 57% with clinically meaningful gains in 3 patients, substantial improvement in two. Group analysis revealed a statistically significant increase in walking [p,0.05] and regression modelling indicated consistent functional benefits across baseline scores.

Conclusion: This suggests that dual task gait training is emerging as a promising rehabilitation strategy for improving mobility and independence in individuals with chronic stroke. The findings from this pilot study provide a justification for a more extensive, full-scale investigation into the subject matter.

Neck Muscle Activity in Individuals Undergoing Cervical Spine Surgery: A Single-Group Pre-post Study

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Introduction: Cervical spine surgery may result in altered neck muscle function, impacting postoperative recovery. Understanding these muscle adaptations is crucial for designing effective rehabilitation strategies. Surface electromyography (sEMG) provides a non-invasive method for objectively quantifying muscle activity. Despite its clinical importance, isometric neck muscle activity before and after surgery remains underexplored.

Aims: This study aims to evaluate neck muscle activity pre-and post-cervical spine surgery using surface electromyography (sEMG).

Methodology: Prospective, single-group pre-post study on 37 medically stable adults (18-65 years) scheduled for elective cervical spine surgery and Numerical Pain Rating Scale (NPRS) score<6 is being done. Maximum voluntary contraction (%MVC) of the sternocleidomastoid and trapezius muscles were assessed using sEMG on pre-operative and postoperatively on day 4 or day of discharge, whichever is later. Comparison of % MVC between pre- and postoperative assessment was done using the Wilcoxon Signed Rank test.

Results: Nine out of 37 participants have been recruited till date. Mean % MVC of Trapezius muscle decreased by 12% (85 to 73) on right side and increased 5% (62 to 69) on left side. % MVC of Sternocleidomastoid muscle decreased by 10% (81 to 71) on right side and increased by 2% (76 to 78) on the left side during the post-operative periods, respectively.

Conclusion: Preliminary results of the study indicate minimal changes in the activation of Trapezius and Sternocleidomastoid muscles between pre-and post-operative periods. Significant postoperative variations in neck muscle activation may highlight the importance of targeted rehabilitation to optimize recovery after cervical spine surgery.

Correlation of Fatigue with Postural Stability in Persons with Parkinson's Disease

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Introduction: Parkinson's Disease, a neurodegenerative disorder of substantia nigra, presents with cardinal features like resting tremors, rigidity, bradykinesia and postural instability. Fatigue presents as a common yet unrecognized non-motor PD symptom that negatively affects levels of physical activity and QoL. There are mixed results about the relation between fatigue and balance. Establishing this relationship can help physiotherapists make better treatment guidelines and balance training protocols.

Aim: To study the correlation of fatigue with postural stability in persons with PD

Methodology: A cross-sectional observational study was conducted among 88 hemodynamically stable persons with Parkinson's Disease. Fatigue is assessed using Parkinson's Disease Fatigue Scale (PFS-16). BTrackS™, a portable balance tracking platform, is used to measure sway velocities. Normality is determined using the Shapiro-Wilk Test. A correlation matrix is conducted for data analysis using Jamovi 2.3.28.

Results: Data of 9 participants (Males: 7, Females: 2) having mean age of 43 years were collected and analysed. Mean onset duration was 4.7 years and Hoehn and Yahr grading < 4. The correlation analysis between the Parkinson's Fatigue Scale-16 (PFS-16) scores and sway velocity showed a Spearman's Rank-Order Correlation coefficient of rho = 0.176 (p = 0.650).

Conclusion: Preliminary findings indicate no meaningful relation between fatigue severity and postural sway in individuals with Parkinson's disease. However, given the very small preliminary sample, these results should be interpreted with caution. Analyses with the full dataset may yield different outcomes.

Role of Interventional Physiatry in Neurorehabilitation of Acute versus Chronic Stroke Survivors: A Retrospective Study

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Background: Stroke remains a major cause of long-term disability. Interventional physiatry, encompassing targeted procedures and individualized rehabilitation, facilitates functional recovery, improving quality of life (QOL).

Objectives: To compare outcomes of interventional physiatry in acute (<6 months) versus chronic (>6 months) stroke survivors, with focus on functional improvement and QOL.

Methods: This retrospective study was conducted in the Department of Physical Medicine and Rehabilitation at AIIMS, Raebareli. Data from March 2022 to August 2024 were reviewed. Acute (1–7days) and Subacute (7days to 6 months) were grouped together and compared with chronic stroke (more than 6 months). Various modalities of Interventional Physiatry were employed, including: Individualized neurorehabilitation protocols, Botulinum toxin injections, nerve blocks, Electrotherapy, orthotic and assistive device prescription. Outcomes were assessed at baseline, 1 and 6 months using the Functional Independence Measure (FIM) scale, Barthel Index, Upper Extremity Functional Index (UEFI) and Lower Extremity Functional Index (LEFI). Results: From a total of 52 stroke survivors (32 males and 20 females), 34.72% were subacute and 65.38% were chronic. There was an average increase of FIM of 7.34% and a 9.48% average improvement in Barthel index. There was a mean improvement of 18.48% in UEFI and 18.77% in LEFI scores. Spasticity, hemiplegic shoulder pain, caregiver burden reduced notably following interventions. Early prescription of orthoses and assistive devices facilitated better mobility and independence.

Conclusion: A patient-specific rehabilitation approach, utilising various modalities of Interventional Physiatry, is essential to optimize recovery and support reintegration into daily life. Ethical approval was obtained from the IEC.

Physiotherapists' Perceptions and Practices of Electrodiagnostic Studies: A Qualitative Exploration

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Introduction: Electrodiagnostic testing, including Nerve Conduction Studies (NCS) and Electromyography (EMG), yields critical physiological data essential for the diagnosis of neuromuscular disorders. However, despite its recognized clinical value, the integration of EDX within physiotherapy practice remains limited, primarily due to inconsistencies in training exposure, variability in practitioner competence, and differing levels of professional confidence.

Aim: To narratively review existing evidence on physiotherapists' competence, training experiences, knowledge gaps, and perceptions related to electrodiagnostic testing.

Methodology: A narrative review methodology was employed to critically synthesise the literature related to electrodiagnostic testing within physiotherapy practice. Relevant peer-reviewed articles, professional guidelines, educational reports, and survey-based studies published in English were examined. Sources were selected based on their relevance to EMG/NCS competency development, training structures, professional awareness, clinical utilisation, and perceived barriers. Evidence was analysed thematically to identify key patterns, gaps, and conceptual relationships.

Results: Evidence shows physiotherapists have limited exposure and confidence in EDX due to insufficient training and minimal hands-on experience. Structured teaching improves competence, but major barriers remain, including lack of experience, limited technological familiarity, and equipment constraints.

Conclusion: Significant gaps persist in physiotherapists' training and use of EDX. Strengthening curriculum content, improving clinical exposure, and enhancing mentorship are essential to support effective utilisation in practice.

Assess the Effect of Bobath Therapy on Postural Control in Patient with Stroke – A Single Case Study

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Introduction: The Bobath Concept, is one of the new approach in management of Neurological Impairment. This Concept uses movement and sensory analysis to diagnose postural and movement issues, guiding intervention and assessment. Its Clinical reasoning process is based on Model of Bobath Clinical Practice (MBCP, 2017). Impairment in Postural Control is one of the major concerns in patient with stroke due to Muscle weakness, sensory deficits, and compensations limits function; improving trunk control is key in neurorehabilitation. Hence the purpose of this study was to assess Bobath therapy's effectiveness in improving postural control in stroke patients.

Aims: To assess the effectiveness of Bobath therapy to improve Postural control in sitting, standing & sit to stand to sit in the patient with stroke.

Methodology: Single-case study in Goa using the Bobath MBCP model on a 1-year post-stroke patient; 1-hour sessions delivered 5 days a week. Outcome measure used were clinical observation; Trunk Impairment Scale (TIS) & Berg Balance Scale (BBS) pre- and post-intervention.

Results: There was a change of score in both outcome measures that is in (n = 1) trunk impairment scale (Pre = 10 and Post = 17), berg balance scale (Pre = 25 and Post = 36) post Bobath therapy intervention. It shows that Bobath therapy improves postural control in stroke patients and helps normalize movement to enhance activity and participation.

Conclusion: This study suggests that using bobath concept (MBCP) is effective in improvement of postural control in patient with stroke. Future research may require rigorous research in this.

"Neurorehabilitation in a Rapidly Changing Digital Era: A Review of Telerehabilitation Adaptation Challenges"

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Background: The increasing prevalence of neurological disorders has intensified the demand for accessible, continuous, and cost-effective rehabilitation services. Telerehabilitation (TR) has emerged as a viable model to extend neurorehabilitation beyond traditional clinical settings. However, integrating clinical needs with evolving technological capabilities remains a critical challenge.

Aim: This narrative review synthesizes evidence from recent studies to explore how technological innovation can better align with clinical priorities in neurorehabilitation.

Methods: A narrative review approach was used to examine key findings from the literature with the key keywords "rehabilitation," "tele-rehabilitation," and "neurological condition." Articles published in English with targeted research on patient and clinician perceptions of telerehabilitation, cost-effectiveness, and neurorehabilitation outcomes were included.

Results: Evidence indicates that TR enhances accessibility, reduces travel-related barriers, and supports continuity of care for individuals with stroke, Parkinson's disease, and other neurological conditions. Several studies demonstrate comparable improvements in motor and functional outcomes between TR and conventional therapy. Cost-effectiveness analyses further highlight reduced financial burden for both patients and healthcare systems. However, obstacles such as inadequate digital infrastructure, limited clinician training, usability issues, and cultural or regulatory constraints hinder optimal implementation, particularly in low-resource settings. Hands-on assessment limitations also suggest the need for hybrid care models.

Conclusion: Integrating clinical requirements with user-centered technological advancements is essential for maximizing the potential of TR in neurorehabilitation. Strengthening digital infrastructure, developing standardized protocols, enhancing training, and adopting hybrid service models can foster sustainable, equitable, and clinically meaningful telerehabilitation practices.

Influence of L1 Listening Comprehension on English Reading Comprehension in Typically Developing Tulu, Beary and Kannada Speaking Children

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Introduction: In multilingual contexts such as coastal Karnataka, children often acquire literacy in English (L2) while speaking non-scripted L1s like Tulu or Beary, or a scripted L1 such as Kannada, in non-academic contexts. Understanding how L1 listening comprehension supports L2 reading comprehension is essential, particularly in early schooling for language-minority children learning to read in a non-native language.

Aims: To examine the influence of L1 listening comprehension on English reading comprehension among typically developing Tulu-, Beary- and Kannada-speaking children.

Methodology: This cross-sectional study involves English-medium CBSE school children grouped by L1 and grade.

- Phase 1 included translation, validation, and pilot testing of the L1 listening comprehension stories from English narratives by native-speaking SLPs.
- Phase 2, includes assessing L1 proficiency (LEAP-Q Child), receptive-expressive skills (ALD), L1 listening comprehension (validated narratives), and English reading comprehension (syllabus narratives).

Results: Across all L1 groups, Grade 3 children show higher English reading fluency, comprehension, and L1 listening comprehension than Grades 1 and 2. No significant effect of gender or L1 script exposure (scripted vs. non-scripted) was noted on English reading outcomes. Home reading practice appears to be the strongest contributor to performance. Outliers reflect differences in home literacy exposure rather than L1 background.

Conclusion: Preliminary findings suggest that L1 listening comprehension supports English reading development regardless of script status. Strengthening L1 oral skills and home reading practices may enhance L2 literacy outcomes. Final results will offer further insight.

Integrated Cognitive Control Training for Anxiety Disorders: Pilot Study of a Novel Smartphone App-Based Intervention

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Introduction: Cognitive deficits in anxiety disorders (ADs) are prominent, contribute to significant clinical and socio-occupational dysfunction, and poorer prognosis. Cognitive training has shown promise with brain injuries, but with limited application to psychiatric disorders. Integrated Cognitive Control Training (ICCT), showing preliminary evidence in obsessive-compulsive disorder and depression, remains to be tested in ADs.

Aim: We describe the pilot trial of the adapted ICCT to ADs undertaken across two hospitals in India.

Methodology: Participants with a DSM 5 diagnosis of ADs (n = 5; Generalized Anxiety Disorder/ Social Anxiety Disorder/ Panic Disorder) right-handed, 18–50 years, minimum 7th standard education, working knowledge of English, and access to smartphone, with no changes to treatment during the trial, were recruited from two psychiatric institutes in India. The intervention consisted of eight therapist-guided sessions and two hours per week of 'Cogtrain' app-based homework exercises for cognitive control. Pre and post-intervention assessments included: anxiety severity (Hamilton Anxiety Rating Scale), depression severity (Montgomery-Asberg Depression Rating Scale), socio-occupational functioning (Work and Social Adjustment Scale), standardized neuropsychological measures (attention, executive functions and memory).

Results: Change scores were calculated for the participants on all the measures. Participants demonstrated improvements on neuropsychological measures (working memory, cognitive flexibility, planning, verbal learning and memory), metacognitive regulation, socio-occupational functioning, and severity of anxiety and depression.

Conclusion: ICCT demonstrates improvements on the trained domain of cognitive control, as well as generalisation to untrained domains (metacognition, symptom severity and socio-occupational functioning). ICCT merits testing in larger controlled trials, and may offer novel, scalable interventions in resource-constrained settings.

Integrated Cognitive Control Training: Adaptation to Anxiety Disorders and Development of Smartphone Application

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Introduction: Cognitive control refers to the effortful regulation of cognitive resources to facilitate flexible responses based on changing demands. Emergent research suggests that dysfunction in cognitive control may contribute to the development and maintenance of anxiety disorders (ADs), and predict poorer outcomes. A novel intervention demonstrating preliminary evidence in OCD and depression – Integrated Cognitive Control Training (ICCT), has potential for transdiagnostic application, and delivery through smartphone application.

Aims: We describe the adaptation of ICCT to ADs and development of a smartphone app for its delivery.

Methodology: We followed the Six Steps for Quality Intervention Development (6SQUID) and co-creation approaches for intervention adaptation and app development. It involved literature and app reviews, and interviews with the clinicians (n = 5) and individuals with ADs (n = 6).

Results: Based on the reviews and interviews, ICCT was adapted by prioritizing cognitive domains and modifying session structure; and a therapist manual was drafted. A smartphone app, Cogtrain, was developed through iterative collaboration among investigators, software developers, and IT experts, incorporating gamification, calibrated difficulty, rewards, and secure registration and data upload, in line with Indian laws.

Conclusion: The poster outlines the systematic adaptation and digitization of a novel cognitive training program. With its process-specific, transdiagnostic, and scalable digital delivery design, ICCT may present a feasible intervention for resource-constrained settings.

Navigating Urban Spaces: A Phenomenological Inquiry into Community Mobility Among Stroke Survivors in India

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Introduction: Stroke survivors in urban India face significant challenges in engaging with their communities post-stroke. Community mobility—a critical component of independence and quality of life—is often disrupted by a range of physical, psychological, and environmental barriers. This study explored how these factors influence the lived experiences of mobility among stroke survivors.

Aims: The study aimed to understand the lived experiences of community mobility among urban Indian stroke survivors. Specific objectives included:

Identifying key factors that influence mobility post-stroke

Examining socio-cultural, environmental, and personal challenges

Documenting coping strategies sused to enhance independence

Methodology: A descriptive phenomenological design guided this qualitative study. Fourteen stroke survivors from Mumbai were recruited through purposive sampling. In-depth, semi-structured interviews were conducted in Hindi, Marathi, or English based on participant preference. Thematic analysis was used to interpret the transcribed data and identify recurring patterns and insights.

Results: Participants reported that stroke significantly impacted their ability to move within the community. Barriers included physical limitations, inaccessible infrastructure, and psychological effects such as fear of falling and social withdrawal. Social support, especially from family, served as both a facilitator and a constraint. Financial limitations and poor urban design further compounded these issues. Survivors employed strategies like routine adaptation, technology use, and selective participation in meaningful outings to maintain some degree of mobility.

Conclusion: Community mobility post-stroke is shaped by interrelated personal, social, and environmental factors. The findings highlight the need for inclusive urban infrastructure and tailored rehabilitation policies to support survivors' mobility and autonomy.

Taste Detection and Identification Deficits in Stroke Survivors: Implications for Dysphagia Assessment

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Post-stroke brain damage disrupts shared circuits between swallowing and gustatory pathways, leading to dysphagia and taste impairments that affect nutrition and quality of life. However, dysphagia assessment largely prioritizes biomechanics, often overlooking gustatory perception.

Aim: To compare gustatory detection and identification abilities of individuals with stroke with neurotypical adults.

Method: This cross-sectional, exploratory study included 30 individuals with stroke and 30 neurotypical adults aged 30–60 years. Nine taste solutions, including neutral (water), and sweet, salty, sour, and bitter at mild and extreme concentration were prepared using calibrated measurements and stored in opaque, numbered bottles. Participants rinsed before receiving 3 ml of each solution (randomized). After holding in mouth for 5 seconds, they spat it, and rinsed twice before reporting taste detection and identification, that was recorded. Scoring was done separately for detection and identification of taste. Scores of 0 and 1 were given for incorrect and correct detection/identification of the tastes respectively.

Results: Mann–Whitney U test indicated significant group differences for detection and identification of mild salty and bitter tastes ($p < 0.05$), whereas detection and identification was preserved for neutral taste, mild for sweet and sour tastes and extreme for all four tastes.

Conclusion: Differential gustatory abilities are present in stroke survivors where mild salty and bitter taste is affected whereas sweet and sour are preserved, highlighting the need for integrating gustatory assessment into dysphagia evaluation of individuals with stroke, that can help in dietary decision making for ensuring a better quality of life.

Keywords: taste-detection, taste-identification, stroke.

Challenges and Experiences of Long-Term Physiotherapy Rehabilitation in Patients with Stroke: A Cross-Sectional Survey

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Introduction: According to the Global Burden of Diseases, India bears the majority of the burden of stroke, accounting for 77.7% of disability-adjusted life years lost. According to the Mumbai registry study, one in three stroke patients is not receiving proper care. Therefore, it was essential to explore the barriers to Physiotherapy care from the patient's perspective.

Aims: To study the challenges and experiences of long-term Physiotherapy rehabilitation in patients with stroke

Methodology: This survey was conducted at various communities and clinics in Mumbai and Navi Mumbai after the approval of the Institutional Ethical Committee. A total of 500 sub-acute and chronic stroke survivors participated. Data were collected through face-to-face interviews using a self-generated, validated structured questionnaire. The questionnaire had a fixed set of open-ended and closed-ended questions. The responses were recorded and analysed.

Results: The majority of stroke survivors were male (62%), and the age group was 52 to 70 years. The education and socioeconomic status varied widely. The survey revealed that most of them required moderate to maximal assistance (45%) for mobility at discharge. Tasks like grooming, showering, and communication were most challenging for them. Although doctors had advised to continue Physiotherapy for most of them but along with other causes, the two major causes of discontinuing Physiotherapy were lack of awareness and financial support.

Conclusion: The government, healthcare professionals and society must address major barriers to stroke rehabilitation through awareness programs, effective policies for financial support, transport and caregiver assistance, and equitable expansion of rehabilitation services.

Factors Influencing the Amount of Paretic Upper Limb Use During Initial Hospitalization After Stroke

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Background: Stroke commonly results in hemiparesis, with arm dysfunction being one of the most disabling consequences. Early after stroke, individuals tend to rely on the non-affected upper limb, leading to learned non-use of the paretic arm. Although early activation is crucial, paretic upper limb use during initial hospitalization remains low and factors that influence the same remain poorly understood.

Objective: To identify factors influencing the amount of paretic upper limb use during initial hospitalization after stroke.

Methods: This cross-sectional observational study is being conducted in Kasturba Hospital, Manipal. Using purposive sampling, 60 first-ever adult acute stroke patients with mild-moderate upper limb impairment (Brunnstrom Grade 3) are being recruited. Exclusion criteria include any conditions limiting arm use, cognitively unsound patients. Bilateral upper limb activity is recorded using wrist-worn accelerometers (ACTi Graph wGT3X-BT®) for 8 hours/day over 3 days. Six outcome measures assess physical factors (sensory/motor impairments), psychological factors (motivation/anxiety/self-efficacy), pre-stroke activity levels and socioeconomic status. Linear regression analyses will be performed using SPSS-v31 with significance set at $p<0.05$.

Results: Data collection is ongoing. Ten participants have been enrolled (3 females/7 males). Median age was 64.5 years, low stroke severity and mild upper limb impairment (NIHSS: 4.5; FMA-UL: 123). Participants exhibited high self-efficacy, low anxiety and depression, high physical activity and motivation levels, and predominantly low–middle socioeconomic status. The influence of these factors on paretic upper limb use is yet to be analyzed.

Conclusion: Identifying factors influencing early paretic arm use may guide strategies to enhance motor recovery during initial hospitalization after stroke.

Script Effects on Eye Movements in English–Kannada Biliterates: A Pilot Eye-Tracking Study

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Introduction: Reading integrates visual and linguistic information, yet scripts differ in symbol–sound mapping. These structural differences shape decoding strategies used during reading. English, with inconsistent grapheme–phoneme mappings, is a deep alphabetic script, while Kannada is a transparent alphasyllabary whose visually complex characters map more directly to sounds. Comparing biliterate readers of these contrasting systems thus highlights how orthographic structure influences online reading behaviour.

Aims: This pilot study examined the effect of script on eye-movement behaviour during single-word reading in English–Kannada biliterates, and compared real versus pseudoword processing and syllable-length effects across scripts.

Methodology: Twenty proficient English–Kannada biliterate adults (18–55 years) participated in a within-subject eye-tracking experiment using a screen-based Tobii Pro Fusion system (120 Hz). Participants read aloud real and pseudowords in English and Kannada, matched in meaning (real words) or syllable length (pseudowords) across 2–5 syllables. Key eye-movement measures included first fixation duration, fixations per word, gaze duration, saccade length/amplitude, and skipping probability. Paired comparisons were performed following normality checks.

Results: Significant script-based differences emerged. Kannada showed longer first fixation durations, more fixations per word, longer gaze durations, and shorter saccade amplitudes than English. Pseudowords elicited longer fixations, more fixations, and reduced skipping relative to real words. Syllable length increased fixation measures and reduced saccade amplitude.

Conclusion: Findings support script-dependent influences on reading, showing that orthographic structure modulates eye-movement control. These results support proposals that universality in reading exists alongside script-specific adaptations. Larger studies will clarify script relativity effects in biliterate populations.

Effectiveness of Sensorimotor and Gait Training on Proprioception and Balance in Patients with Diabetic Peripheral Neuropathy: A Comparative Study

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Introduction: Individuals with diabetes face a significantly higher risk of lower limb amputation, estimated to be 10 to 30% greater than those without diabetes. A substantial 85% of non-traumatic amputations in diabetic patients originate from foot ulcers. Early intervention is crucial to control diabetic peripheral neuropathy symptoms (DPN) and enhance balance. To address functional sensibility, adaptive functioning and balance improvement, this study combines sensorimotor training and gait training.

Aim: The aim of the study is to determine the effects of sensorimotor and gait training on proprioception and balance in patients of Diabetic peripheral neuropathy.

Material and Method: This study included diabetic individuals of both genders between the ages of 45–65 years, diagnosed with peripheral diabetic neuropathy with controlled blood glucose levels. 70 Participants were identified out of 92 and divided into control group and interventional group which received conventional and exercises program in sand respectively for balance and proprioception for a period six weeks.

Results: Individuals In Interventional group experienced statistically significant improvement in TUG duration from 15.6 ± 2.35 to 11.6 ± 2.07 ($p < 0.0001$), increased time duration of single leg stance. The outcome measures showed significant improvement in the control group as well.

Conclusion: Sensorimotor and gait training for 6 weeks of duration reported improvement in proprioception and balance among diabetic peripheral neuropathy patients.

Cue-Based Feeding and Neuroprotective Neonatal Therapy in an Indian NICU: A Pilot Implementation Study

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Infants admitted to the neonatal intensive care unit (NICU) are at increased risk for feeding difficulties, altered sensory exposure, and disrupted bonding, all of which may impact neurodevelopment and readiness for discharge. Cue-based feeding and neuroprotective developmental care approaches have been shown to improve short- and long-term outcomes internationally; however, structured and therapist-led implementation remains limited in Indian NICU settings. This pilot quality-improvement project aimed to integrate a neonatal therapy framework focusing on individualized cue-based feeding progression, sensory modulation, neurodevelopmental positioning, and parent coaching in a Level III NICU over an 8-week period.

Eligible participants included medically stable preterm or term infants with feeding or neurobehavioral challenges. Standardized tools, including a Feeding Readiness Scale, Neonatal Behavioral Observation indicators, and a Parent Confidence Rating Scale, were used before and after intervention. A total of (insert number) infants participated. Following implementation, infants demonstrated improvement in feeding readiness scores, faster transition to full oral feeding, and enhanced state organization. Parents reported increased confidence in recognizing cues, feeding positioning, and supporting self-regulation. No intervention-related adverse events occurred.

Preliminary findings support the feasibility, acceptability, and positive clinical impact of integrating neonatal therapy and cue-based care in an Indian NICU context. The model strengthened parent involvement, enhanced neurobehavioral stability, and supported smoother NICU-to-home transition. Larger controlled studies with long-term developmental follow-up are recommended to validate results and inform scalable neonatal therapy pathways across Indian healthcare systems.

Why Not Walk First, Barriers to Implementing Functional Task-Specific Exercise in Stroke Rehabilitation: A Qualitative Study

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Introduction: Functional task-specific exercise (FTSE) is well established as an effective rehabilitation intervention for improving walking ability after stroke. However, despite robust evidence, its clinical adoption remains inconsistent.

Aims: This study explored the factors influencing physiotherapists' decision-making and the barriers and facilitators affecting the implementation of FTSE in walking rehabilitation following stroke.

Methodology: A qualitative study using semi-structured interviews was conducted with 16 physiotherapists working across diverse clinical settings. Participants were selected using purposive sampling to ensure representation from various practice contexts. Data were analyzed using Braun and Clarke's six-phase framework for thematic analysis. Two independent researchers coded the data, and discrepancies were resolved through discussion and reference to the original transcripts to ensure analytic trustworthiness.

Results: Physiotherapists identified several barriers to FTSE implementation, including a persistent strength-first approach, risk-averse decision-making, patient expectations favoring conventional impairment-based therapy, and systemic constraints such as staffing shortages and limited resources. Facilitators included professional experience, recognition of task-specificity in improving function, and supportive institutional culture. Thematic analysis revealed an interplay between clinician beliefs, contextual limitations, and patient-related factors shaping decision-making.

Conclusion: Despite awareness of FTSE's benefits, its consistent implementation remains hindered by entrenched clinical habits and systemic barriers. Addressing these challenges through structured implementation strategies, clinician education, and institutional support may bridge the evidence–practice gap and promote task-specific, functional rehabilitation.

Evaluating the Effectiveness of a Self-Review Module on Improving Speech-Language Pathologists Knowledge of Right Hemisphere Disorder in India

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Introduction: Right Hemisphere Disorder (RHD) results in cognitive-communicative deficits that are under-recognized in clinical practice. Although included in Speech-Language Pathology curricula, awareness and application remains limited. To ensure accurate diagnosis and management, Speech Language Pathologists (SLPs) must recognize RHD features, prompting this study.

Aim: To develop a self-review module on RHD for SLPs in India and study its effectiveness.

Methodology: A self-review module was developed in power point format that was video recorded with voice over to the slides. Among the 88 SLPs who participated in the study, pre-post comparison of knowledge about RHD was done with a developed questionnaire for 57 SLPs after viewing the developed self-review video module that was content validated by five SLPs using the Delphi technique. Data was analysed using Jeffreys' Amazing Statistics Program.

Results: While 70%-80% of SLPs recognize the right hemisphere's communicative role, only 40–60% understand the deficits, and interventions. Participants' pre-test scores (Mean = 15.98, SD = 8.92, Range: 0–33) increased after viewing the module (Mean = 22.16, SD = 9.91, Range: 5–43). Paired-samples t-test revealed a significant difference between pre-test and post-test scores [t (56) = 6.30, p <.001], suggesting that the self-review module was effective in improving SLPs' knowledge of RHD.

Conclusion: The findings reveal that many SLPs lack adequate knowledge of RHD-related deficits, and intervention strategies, underscoring the need for specialized educational resources. The developed self-review module proved effective in enhancing SLPs' understanding and awareness of RHD, emphasizing the importance of continued professional training in this area.

Enhancing Narrative Discourse in Conduction Aphasia Using NADIIA: A Single-Case Study

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Background: Discourse production requires integrating lexical, syntactic, and macrostructural levels of language, making it particularly challenging for people with aphasia (Whitworth et al., 2015). Narrative and Discourse Intervention in Aphasia (NADIIA) supports this by using discourse frameworks and a metalinguistic approach to scaffold connected speech through planning, sequencing, verb expansion, argument structure building, and cohesive devices.

Aim: To evaluate progress in narrative discourse abilities in an individual with aphasia following the application of NADIIA-based intervention strategies.

Method: 53 year old male diagnosed as having Conduction Aphasia secondary to Left MCA infarct was recruited for the study. The NADIIA intervention was then introduced to the participant. Generating key words, verb-argument structure frames, mind maps and self evaluation were applied at various complexity levels. A pre post picure description analysis was carried out using 'Mane Horage Aduge' picture. Productivity, Discourse efficiency, grammatical organization and discourse organization were analyzed as a part of Discourse analysis.

Result: Following 20 sessions of NADIIA intervention, the participant showed a marked improvement across multiple discourse measures. Discourse efficiency improved significantly, as evidenced by increased Content CIUs and higher %CIU scores, indicating more informative and contextually appropriate language production. Picture description and conversational output exhibited clear functional gains, with DAS scores increasing from 53.57% to 73.21% for picture description and from 43.4% to 72.3% for conversation.

Conclusion: The systematic use of NADIIA strategies led to noticeable improvements in the patient's narrative discourse, demonstrated by greater productivity, improved grammatical structure, and higher overall discourse quality.

Measuring Readiness for Physical Activity After Stroke: A Scoping Review of Available Tools and Frameworks

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Introduction: Physical Activity (PA) after stroke reduces recurrence, enhances rehabilitation outcomes, and promotes long-term functional independence. However, adherence to PA remains low, and stroke survivors' readiness to engage in PA is poorly understood. Assessing willingness is therefore essential for evaluating readiness to adopt PA, which encompasses physical ability but also psychological factors like self-efficacy and motivation. Understanding these factors is critical for designing and tailoring interventions. This scoping review synthesizes the available tools, frameworks and methods used to assess PA readiness post stroke.

Aim: To identify and synthesise the available methods, theories, and tools for measuring physical activity readiness post-stroke.

Methods: Following the Joanna Briggs Institute guidelines, we systematically searched PubMed, Embase, CINAHL, Cochrane, and Scopus from inception to February 2025. Studies published in English language involving adults with stroke, that reported tools, frameworks and methods assessing PA readiness were included. Data extraction was conducted by two independent reviewers and results were collated based on PA domains and psychometric properties.

Results: From 8,592 records screened, 24 studies were included. Seven tools, one theoretical framework, and one method were identified. Most tools identified measured single dimension of readiness like motor ability, self-efficacy or physical capacity. Psychometric properties showed diverse results along with geographic imbalance as most of the tools originated from high-income countries.

Conclusion: Current tools inadequately measure PA readiness, highlighting the need to develop and validate a multidimensional measures capturing all the components of readiness towards PA post stroke.

Keywords: Cerebrovascular accident, Exercise, Outcome Measure, Scoping review, Willingness

Cognitive Assessments for Minimal Cognitive Impairment (MCI): A Systematic Review

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Introduction: Cognition is vital for effective performance across diverse daily tasks such as work, education, home management, and play and leisure. Early identification of MCI is crucial to institute effective therapeutic strategies and to delay progression. The use of cognitive instruments to assess MCI is obscured with a lack of consensus of which is the most suitable to use.

Aims: To systematically analyse various assessments used to detect MCI and to evaluate their measurement properties.

Methods: The study design was a Systematic review using PRISMA guidelines. Various databases were examined for potential publications which reported at least one cognitive assessment. Data Extraction and Synthesis were done using COSMIN criteria and GRADE criteria.

Results: A total of 57 studies were included. The findings included various tools which were categorized as Screening Tools for Minimal Cognitive Impairment, Cognitive Assessments and Functional Cognitive Assessments. Among the screening tools for Minimal Cognitive Impairment, MOCA and MMSE were the most frequently used. MOCA screening tool showed the highest sensitivity for detection of cognitive impairment. Cognitive assessments like the Trailmaking Test, Verbal Fluency Test, also demonstrated strong psychometric properties. Among the Functional Cognitive Assessments, the EFPT and ECOG questionnaires showed strong ecological validity, though their use for early MCI detection remained limited.

Conclusion: The findings indicate that there are various cognitive assessment tools for MCI reported across literature. While some cognitive assessments have been shown to have strong psychometric properties others have yet to establish their reliability and validity.

Comparative Analysis of Treadmill-Based Multidirectional Walking in Individuals with Parkinson's Disease and Age-Matched Healthy Individuals

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Introduction: Parkinson's disease (PD) is a common neurodegenerative disorder that leads to debilitating motor and non-motor symptoms. Multi-directional walking (MDW) presents promising benefits for motor rehabilitation in individuals with neurological conditions. Comparative studies involving age-matched healthy individuals are necessary better to understand the gait deficits present in the PD population.

Aims: This study aims to analyze multi-directional treadmill walking performance in individuals with Parkinson's disease by comparing their results to those of age-matched healthy individuals.

Methods: A pilot comparative study design was adopted. Participants included individuals with Parkinson's disease in Hoehn and Yahr stages I to III, matched with an equal number of healthy individuals in terms of age, resulting in a total of 10 participants. Each participant underwent standardized treadmill walking protocols that included forward, backward, and lateral movements. The outcome measures assessed were step width, cadence, stride length, distance covered, maximum speed and average load. Statistical analysis will be conducted to determine significant differences between the groups, with a focus on the impact of the disease on multi-directional walking ability and complexity.

Results: Data collection is currently underway and will aim to identify gait parameters and impairments unique to the PD group compared to the controls. Age matching helps to minimize confounding variables related to physiological aging.

Discussion: This study is expected to provide comparative insights into the multi-directional walking capabilities of PD patients and healthy individuals. The findings aim to inform physiotherapy protocols designed to improve gait impairments in PD, ultimately supporting the development of evidence-based rehabilitation.

Enhancing Awareness of Stroke Rehabilitation Through Stroke Survivor – Therapist – Community Alliance: An Interventional Study

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Background: Therapeutic alliance represents a collaborative relationship between patients and therapists aimed at achieving shared rehabilitation goals. Extending this alliance beyond clinical settings into the community may enhance public. This study aimed to evaluate the effectiveness of a stroke awareness module delivered by a stroke survivor acting as a community ambassador for stroke rehabilitation.

Methodology: A structured stroke rehabilitation awareness module was developed in the local language, outlining the multidisciplinary team involved in stroke care and their roles from the acute to chronic phases of recovery. A native stroke survivor from the local community provided informed consent and was trained by the rehabilitation team to deliver the module within his village. The intervention was implemented across nine villages surrounding a tertiary care hospital, with one stroke survivor ambassador per village. Awareness levels were assessed using a self-developed and validated questionnaire administered before the intervention (X1), immediately after (X2), and one month post-intervention (X3). Statistical analysis was performed using paired t-tests.

Results: Paired t-test analysis demonstrated a statistically significant improvement in awareness scores immediately after the intervention (X1–X2; $t = 0.03$, $p < 0.05$) and sustained improvement at one-month follow-up (X2–X3; $t = 0.006$, $p < 0.05$). Qualitative observations revealed increased engagement and receptiveness among community members when information was delivered through the stroke survivor's personal experiences.

Conclusion: Utilizing a stroke survivor as a community instructor, supported by a multidisciplinary therapy team, effectively enhanced public awareness of stroke rehabilitation and facilitated retention of information over time.

Dysphagia Related Quality of Life Among Persons with Mild to Moderate Dementia: An Exploratory Study

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Introduction: Dementia is a progressive neurological syndrome marked by impairments in memory, language, and judgement (ICD, 2007; WHO, 2017). Dysphagia is common in dementia and significantly affects quality of life, with prevalence increasing alongside disease severity (Rogus-Pullia et al., 2015). Impairments in cognitive functions can interfere with critical stages of the swallowing process (Leopold & Kagel, 1997). hence, exploring cognition, dementia severity and functional oral intake affects swallowing abilities among persons with dementia in the Indian population is both clinically relevant and valuable for informed care.

Method: A cross-sectional exploratory study was conducted with 22 participants aged between 55–75 years, clinically diagnosed with mild to moderate dementia and dysphagia. Montreal Cognitive Assessment (MoCA), Clinical Dementia Rating Scale (CDR), Functional Oral Intake Scale (FOIS) and Dysphagia Quality of Life Questionnaire in Marathi (DQOL-QM) were administered. Participants were grouped based on dementia severity, and both descriptive and inferential statistics were used to analyze the data.

Results: Significant differences in DQOL-QM scores were observed between individuals with mild and moderate dementia. Cognitive abilities showed a significant association with swallowing-related quality of life, especially in the eating and psychological domains of DQOL-QM. Functional oral intake was also notably linked with swallowing-related quality of life, primarily in the eating domain.

Conclusion: Swallowing-related quality of life declines as dementia severity increases. Cognitive abilities are crucial for maintaining safe, efficient, and meaningful eating experiences. These findings highlight the importance of early dysphagia screening and cognitively informed intervention strategies in dementia care.

Structured Prognostication in Acute Stroke Using a Transparent Large Language Model

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Background: Prognostication after acute stroke is central to clinical decision-making, family counseling, and rehabilitation planning. Although established clinical variables and scales—such as age, stroke subtype, NIHSS score, imaging characteristics, and premorbid function—inform outcome expectations, translating these data into clear, individualized, and uncertainty-aware prognostic explanations remains challenging in routine practice.

Objective: To describe the design and intended clinical role of a transparent large language model (LLM), Stroke Prognosis GPT, developed to interpret structured stroke data and generate evidence-based prognostic summaries without providing treatment recommendations.

Methods: The model accepts structured clinical inputs including demographics, stroke type (ischemic or hemorrhagic), stroke severity, imaging features, treatments received, comorbidities, and pre-stroke functional status. Using predefined medical reasoning constraints, the LLM synthesizes these inputs into probabilistic outcome ranges (e.g., functional recovery, mortality risk, rehabilitation potential) derived from population-level stroke literature. Outputs emphasize contributing prognostic factors, explicitly communicate uncertainty, and frame all estimates as supportive rather than deterministic.

Results: Stroke Prognosis GPT generates concise, interpretable narratives that contextualize numeric stroke scores, identify key drivers of prognosis, and adapt language for clinician or patient-facing communication. The system is intentionally restricted to avoid treatment advice and is designed to support—rather than replace—clinical judgment.

Conclusion: This work demonstrates the feasibility of using a transparent LLM as a structured prognostication and communication tool in acute stroke care. By converting standardized clinical data into explainable outcome narratives, such models may enhance clinician–patient discussions and shared understanding of prognosis. Prospective evaluation is needed to assess usability, safety, and clinical impact.

An Explainable AI Assistant for Clinical Interpretation of Instrumented Gait Analysis

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Background: Instrumented gait analysis generates large volumes of temporal–spatial, kinematic, kinetic, and electromyographic data. Despite its clinical value, interpretation remains time-consuming, highly specialized, and inconsistently communicated to clinicians and patients.

Objective: To present an AI-based gait report interpretation system designed to translate complex motion analysis data into clinically meaningful insights for healthcare professionals and patient-friendly explanations for families.

Methods: We developed a specialized large-language-model–based assistant trained on established gait analysis frameworks, including biomechanical principles from Perry, Gage, Baker, Whittle, and Kirtley. The system processes structured gait reports (e.g., Vicon, Qualisys outputs) and generates summaries of temporal–spatial parameters, kinematics, kinetics, and EMG where available. Findings are compared against normative datasets, asymmetries are highlighted, and likely biomechanical contributors (e.g., weakness, contracture, compensatory strategies) are described. Outputs can be generated in either a clinician-focused or patient-friendly mode.

Results: The system produces standardized, reproducible gait interpretations, clearly identifying abnormal patterns and side-to-side differences while maintaining clinical terminology and biomechanical accuracy. Patient-mode outputs improve accessibility by translating technical findings into plain language without altering underlying clinical meaning.

Conclusion: This AI-driven gait interpretation assistant demonstrates the potential to enhance efficiency, consistency, and communication in clinical gait analysis. It serves as a decision-support and educational tool, not a diagnostic system, and may support multidisciplinary teams in routine practice and research dissemination.

A Rule-Based Clinical Decision Support GPT for Prognostic Reasoning in Cerebral Palsy

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Prognostic discussions in cerebral palsy (CP) are complex, probabilistic, and highly sensitive to incomplete clinical information. Clinicians must integrate motor classification systems, neuroimaging patterns, developmental trajectories, and comorbidities while communicating uncertainty clearly to families. This work presents a specialized generative AI–based clinical decision support tool designed to assist with structured prognostic reasoning in cerebral palsy.

The system accepts free-text clinical case descriptions and internally maps them to a structured representation encompassing CP subtype, gross motor function, neuroimaging findings, comorbidities, and developmental indicators. Prognostic synthesis is governed by explicit rule-based constraints and known developmental trajectories, preventing inference when key data are missing and avoiding deterministic predictions. Outputs are generated in natural language and can be tailored to either clinician-facing or parent-facing communication styles while preserving the same underlying clinical logic.

Unlike general-purpose large language models, this GPT explicitly encodes domain constraints, emphasizes uncertainty, and avoids treatment recommendations, life expectancy estimates, or quality-of-life judgments. This approach demonstrates how generative AI can support nuanced prognostic reasoning in pediatric neurodisability while respecting clinical uncertainty, ethical boundaries, and communication standards. The model illustrates a pathway for responsible use of AI in sensitive prognostic contexts rather than automated outcome prediction.

From Awareness to Adoption: Telerehabilitation Acceptance for Stroke Care Among Neurorehabilitation Professionals in Maharashtra

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Background: Telerehabilitation has emerged as a viable model to extend stroke neurorehabilitation services, yet its routine adoption depends on acceptance among rehabilitation professionals. This study examined acceptance, current use, and perceived barriers and facilitators of telerehabilitation for stroke care among neurorehabilitation professionals in Maharashtra.

Methods: A cross-sectional, questionnaire-based online survey was conducted in June 2025 among neurorehabilitation professionals involved in stroke care across Maharashtra. Invitations were circulated to 450 clinicians through professional networks, with 201 complete responses received (response rate 44.6%). Respondents included physiotherapists (72%), occupational therapists (11%), speech and language therapists (9%), rehabilitation physicians (6%), and clinical psychologists (2%). Data captured awareness, utilization patterns, perceived barriers and facilitators, and acceptability of telerehabilitation.

Results: Mean professional experience was 8 ± 5 years. While awareness was high (99% reported full or partial awareness), only 46% were actively delivering telerehabilitation services. Among users, most managed 1–5 stroke patients per week remotely, primarily via mobile-based platforms. Key barriers included difficulty obtaining adequate clinical information remotely (74%), lack of direct monitoring (65%), technical disturbances (60%), and challenges related to older patients' digital literacy (57%). Facilitators included reduced travel burden (66%) and improved access to rehabilitation services (62%). Overall, 84% perceived telerehabilitation as beneficial, with 63% rating it acceptable and 61% accessible for stroke care.

Conclusion: Despite high awareness and favorable perceptions, telerehabilitation adoption for stroke care in Maharashtra remains suboptimal, highlighting the need for structured training, standardized protocols, and system-level support.

Beyond Passive Monitoring: The "Akantis" Client-Side Safety Architecture for Zero-Latency Tele-Rehabilitation

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Introduction: Current tele-rehabilitation relies on server-side processing, introducing dangerous latency (500–2000 ms) that renders real-time safety interventions impossible. Furthermore, generic "Black Box" AI models fail to account for pathology-specific risks or metabolic readiness (e.g., hypoalbuminemia), often confounding prior deficits with acute stroke symptoms.

Aims: To develop "Akantis," a novel local-execution safety apparatus for low-resource environments that eliminates cloud latency, ensures hemodynamic safety via hardware interlocks, and enables high-intensity remote therapy.

Methodology: The system executes a Parallel Correlation Engine entirely within the client's local browser (Client-Side), processing 150+ clinical variables through 67+ synchronous safety gates. We implemented a "Fail-Safe Default" protocol (validated by 500+ unit tests) where any hemodynamic anomaly (e.g., orthostatic drop >20mmHg) triggers an immediate, hardware-level DOM lock (W3C standard) to physically veto patient interaction.

Results: The apparatus achieves a processing speed of <16ms (one frame), ensuring zero-latency threat detection. It successfully differentiates 30+ pathology states (e.g., Thalamic vs. Lobar hemorrhage), automatically adjusting safety gates for Rebleed Risk and Vasospasm. The "Internal Medicine Engine" effectively calculates metabolic time dilation, while the offline architecture ensures 100% HIPAA compliance.

Conclusion: Akantis establishes a new standard for Transparent Deterministic Logic in tele-rehabilitation. By replacing opaque monitoring with hardware-enforced, prescriptive safety directives, it democratizes neuro-critical care for underserved, zero-connectivity populations.

Poststroke Fatigue: Does It Increase Caregiver Burden?

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Introduction: Post-stroke fatigue (PSF) is a common and persistent neurological sequela that adversely affects functional recovery, participation, and quality of life after stroke. Despite increasing recognition of PSF as a central neurobiological and behavioral consequence of stroke, its indirect impact on caregivers—who are integral to long-term neurological recovery—remains inadequately studied.

Aim: To evaluate the relationship between post-stroke fatigue severity and caregiver burden in individuals with stroke.

Methodology: A cross-sectional study was conducted in a tertiary care neurorehabilitation setting. Thirty unilateral, first-ever stroke survivors reporting fatigue and their primary caregivers were recruited. Fatigue severity in stroke survivors was assessed using the Fatigue Severity Scale (FSS), while caregiver burden was measured using the Zarit Burden Interview (ZBI). Descriptive statistics and correlation analysis were performed, with statistical significance set at $p < 0.05$.

Results: Stroke survivors demonstrated mild to moderate fatigue [median (IQR): 42.5 (18–46.5)]. Caregivers reported predominantly mild to moderate levels of burden [median (IQR): 27 (20.5–45.5)]. A weak positive correlation was observed between fatigue severity and caregiver burden ($r = 0.22$), though this was not statistically significant ($p = 0.53$). Subgroup analysis revealed higher caregiver burden among caregivers of stroke survivors with greater fatigue severity.

Conclusion: Post-stroke fatigue shows a positive association with caregiver burden, suggesting that fatigue may contribute indirectly to caregiving demands. Routine neurological assessment and targeted management of PSF may help reduce caregiver burden and optimize post-stroke recovery outcomes.

ABR Profile in Children with Delayed Speech–Language Development and ADHD (2–6 Years)

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Background: Auditory Brainstem Response (ABR) is an objective measure for evaluating auditory brainstem integrity in children. Abnormal ABR findings have been associated with delayed speech–language development, while children with Attention Deficit Hyperactivity Disorder (ADHD) may show subtle auditory processing differences.

Aim: To compare ABR findings in children with delayed speech–language development and ADHD aged 2–6 years.

Methodology: Eighty children (2–6 years) were included: 40 with delayed speech–language development and 40 with ADHD. Click-evoked ABR was recorded bilaterally. Absolute latencies of waves I, III, and V and interpeak latency I–V were analyzed. Independent t-test was used ($p < 0.05$).

Results: Children with delayed speech–language development showed significantly prolonged wave III (4.20 ± 0.30 ms) and wave V latencies (6.05 ± 0.33 ms) compared to ADHD children (3.95 ± 0.26 ms; 5.70 ± 0.29 ms respectively; $p < 0.01$). Interpeak latency I–V was also significantly increased ($p = 0.002$). Wave I latency showed no significant difference.

Conclusion: Delayed speech–language children exhibit auditory brainstem conduction delay, whereas ADHD children show relatively preserved ABR responses. ABR is useful for differential evaluation and early intervention planning.

Keywords: Auditory Brainstem Response, Delayed Speech–Language Development, ADHD, Children, Pediatric Audiology

Comparison of Pure-Tone Audiometry and Auditory Steady-State Response Thresholds in Young Adults with Normal Hearing

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Introduction: Pure-tone audiometry (PTA) remains the gold standard for behavioural hearing threshold estimation. However, objective methods such as auditory steady-state response (ASSR) are increasingly used, particularly in populations where behavioural testing is not feasible. Establishing the relationship between PTA and ASSR thresholds in normal-hearing adults is important for clinical calibration and interpretation.

Aims: To compare hearing thresholds obtained using Pure-Tone Audiometry (PTA) and Auditory Steady-State Response (ASSR) in young adults with normal hearing sensitivity.

Materials and methods: Study conducted at SGRRIM&HS and SMI Hospital, Dehradun Uttarakhand July 2024 to November 2025. A total of 342 ears from young adults aged 18–25 years were included. Air-conduction thresholds were obtained at 500 Hz, 1 kHz, 2 kHz, and 4 kHz using PTA and ASSR. In this prospective cross-sectional study, we included 171 Yong Adults without any hearing complaints or otologic diseases and normal pure tone thresholds. All subjects had clinical history, otomicroscopy, audiometry and immittance measurements.

Results: The mean PTA average threshold across frequencies was 12.86 ± 2.31 dB HL, whereas the mean ASSR average threshold was 15.82 ± 1.58 dB HL. A paired-sample t-test demonstrated a statistically significant difference between PTA and ASSR thresholds ($t = 21.81$, $p < 0.001$), with ASSR thresholds consistently higher than PTA.

Conclusion: ASSR overestimates behavioral thresholds by approximately 3 dB in normal-hearing young adults. These findings support the clinical use of ASSR as an objective threshold estimation tool, while emphasizing the need for interpretation relative to PTA.

Progressive Functional Recovery Following High-Intensity, Robotics-Augmented Neurorehabilitation in a Young Adult with Complete D9 Spinal Cord Injury: A Case Study

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Background: Complete thoracic spinal cord injury (SCI) is traditionally associated with severe and often permanent motor and functional impairments. Emerging evidence suggests that early, high-intensity, task-specific neurorehabilitation combined with robotic-assisted technologies may enhance neuroplasticity and functional recovery, even in cases classified as complete injury.

Objective: To describe neurological and functional recovery following early, intensive, robotics-augmented neurorehabilitation in a young adult with complete D9 spinal cord injury (ASIA Impairment Scale A).

Methods: A 20-year-old male with traumatic complete D9 SCI (ASIA A) underwent an intensive neurorehabilitation program consisting of 3–4 therapy sessions per day, 6 days per week. The program integrated trunk stabilization exercises, progressive strengthening, task-specific functional training, robotic-assisted cycling, and robotic-assisted gait training. Outcome measures included Manual Muscle Testing (MMT), trunk control assessment, Functional Independence Measure (FIM), Walking Index for Spinal Cord Injury II (WISCI-II), and Visual Analog Scale (VAS) for pain.

Results: At 12 months post-injury, the patient demonstrated emergence of voluntary lower-limb motor activity (MMT improvement from 0/5 to 1+–2+/5), significant improvement in trunk extensor strength (1/5 to 4/5), independent unsupported sitting for over 30 minutes, and independence in bed mobility and transfers. Ambulation was achieved under supervision using HKAFO, with WISCI-II progression from 0. Pain during upright activities reduced from VAS 7/10 to 2–3/10.

Conclusion: This case highlights the potential role of early, high-intensity, robotics-augmented neurorehabilitation in facilitating meaningful neurological and functional recovery, even in individuals with complete thoracic SCI.

Occupational Therapy Interventions for Postoperative Brain Tumor Patients: A Narrative Review

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Introduction: Brain tumors are a heterogeneous group of intracranial neoplasms that often result in significant cognitive, motor, and functional impairments. Patients with brain tumor may experience seizures, hemiplegia, memory deficits, emotional changes, and reduced independence in daily activities, all of which negatively impact quality of life. Occupational therapy (OT) plays an important role in addressing these difficulties through interventions targeting functional performance, cognition, and emotional well-being.

Objectives: This narrative review examines the current evidence on OT interventions for postoperative brain tumor patients, focusing on intervention types, outcomes, and gaps in existing research.

Methods: A literature search was conducted in PubMed, Google Scholar and Scopus using keywords related to "brain tumors", "occupational therapy", and "postoperative rehabilitation". Studies published in English between 2009 and 2025 were included, focusing on randomized controlled trials, systematic reviews, and pilot studies. Eligible studies reported outcomes of OT interventions in postoperative brain tumour patients, excluding studies unrelated to OT or postoperative rehabilitation.

Results: Three key themes emerged. Interventions targeting activities of daily living and functional independence supported recovery of self-care, mobility, and engagement in meaningful routines. Cognitive and emotional interventions demonstrated improvements in memory, attention, fatigue management, and emotional well-being. Motor and upper limb interventions enhanced strength, coordination, and fine motor skills.

Conclusion: Occupational therapy is essential in addressing functional, cognitive, and emotional impairments. Future research should include diverse samples to improve the generalizability of findings across different tumor types.

Keywords: Brain neoplasms, Occupational therapy

Vision-based Estimation of Base of Support and Its Validation

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Introduction: Balancing requires an accurate foot pose, as the position and orientation of the feet define the base of support (BoS) and constrain centre-of-pressure control. Conventional BoS and foot-pose assessment rely on MOCAP or instrumented platforms, which are accurate but costly, complex, and confined to laboratories. A vision-based, anatomically valid foot pose estimator that approximates MOCAP-level accuracy could enable practical, marker-less BoS assessment in research and clinical settings.

Aim: To develop a foot pose estimation model using anatomically valid foot pose data and test its 2D and 3D pose accuracy using the MOCAP ground truth.

Methods: We trained a YOLO pose estimation model on 21,280 time-subsampled, annotated images of foot postures from 20 healthy adults (barefoot), captured with a RealSense D455 camera synchronized with a MOCAP system. For validation, a single subject with markers on key anatomical foot landmarks performed random foot poses (5 s per pose) across three board arrangements; model-predicted keypoints were compared with MOCAP 3D ground truth.

Results: The model achieved mAP@50 of 0.955 and mAP@50–95 of 0.911. For the validation subject, mean absolute centroid errors were 13 ± 4 mm (left) and 17 ± 5 mm (right), with orientation errors of 3.1° ± 1.9° (left) and 4.1° ± 1.1° (right) under static conditions. Under dynamic conditions, orientation error rose (8.9° right, 7.9° left), but positional error stayed below 30 mm, and the mean pixel errors were about 5 pixels.

Conclusion: This vision-based foot pose estimator provides accurate 2D/3D BoS estimates at 1 m, with performance close.

Effect of Backward Walking Training on Balance and Walking Distance in Children with Cerebral Palsy – A Randomised Controlled Trial

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Background: Children with cerebral palsy (CwCP) commonly exhibit impaired gait and reduced dynamic balance, leading to limitations in functional mobility. Backward walking training (BWT) is a task-specific gait intervention that challenges postural control, proprioceptive input, and neuromuscular coordination. The Pediatric Balance Scale (PBS) and the 1-Minute Walk Test (1MWT) are reliable measures to assess balance and functional walking capacity in this population.

Objective: To evaluate the effect of backward walking training on balance and walking distance in children with cerebral palsy.

Methods: This assessor-blinded randomized controlled trial included children with cerebral palsy allocated to either a control or experimental group. The control group received conventional therapy (CT) for 60 minutes, while the experimental group received BWT for 20 minutes combined with CT for 40 minutes. Both groups completed eight sessions over four weeks. Balance and walking capacity were assessed using PBS and 1MWT. Intra-group and inter-group analyses were performed.

Results: The mean age of participants was 7.5 years, with 60% classified as GMFCS Level I and 30% as Level II. Both groups demonstrated significant within-group improvements in PBS and 1MWT. Inter-group analysis showed significantly greater gains in the BWT group, with a mean difference of 3 points on PBS (95% CI: 0.31–5.69; $p < 0.05$) and superior improvement in 1MWT distance (median [IQR]: 7 [4.5–18] vs 4 [0–5]; $p < 0.016$).

Conclusion: Backward walking training improves balance and functional walking capacity in children with cerebral palsy and is a simple, cost-effective adjunct to conventional therapy in low-resource settings.

Dual Modality Analysis of Connected Speech in Persons with Aphasia [PwA]

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Background: Aphasia disrupts oral and written language, affecting productivity, grammaticality, and discourse coherence (Vandenborre et al., 2017). While oral discourse is widely studied, written output remains underexplored in the Indian context. Dual-modality analysis with culturally relevant stimuli can provide complementary diagnostic insights.

Aim: Compare oral and written connected speech analysis in Persons with Aphasia (PwA) using a culturally relevant picture description task and standardized assessment parameters.

Method: Twenty male participants (10 PwA, 10 matched controls) who were native speakers of Hindi, Kannada, and Malayalam completed oral and written descriptions of the "Mane Horage Aduge" picture (NIHSS), presented in randomized order. Oral samples were recorded and transcribed; written samples were handwritten. Measures included total number of words (TNW), content information units (CIU%), grammatical index (GI%), lexical diversity (TTR%), cohesive adequacy, and error rates. The Discourse Analysis Scale (DAS) rated propositional (meaningful) and non-propositional (formulaic) content. Non-parametric tests were used for group comparisons.

Results: This study found that PwA showed markedly reduced informativeness, syntactic complexity, cohesion, and discourse efficiency, with higher error rates than controls in both oral and written picture descriptions. Writing posed greater challenges, yielding fewer words, more errors, and simpler syntax compared to oral modality. Lexical diversity differentiated fluent from non-fluent PwA in the written modality, but not in the oral modality. Additionally, the assessment of propositional content highlighted the difficulty in producing coherent and relevant narratives.

Conclusion: This study is an in-depth analysis of the nature of linguistic limitations in PwA which highlights the importance of connected speech.

Influence of Subject and Therapist Body Mass Index on Lean Release Angle and Forward Stepping Characteristics

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Introduction: Falls occur when individuals fail to counter external perturbations through rapid postural responses. Recent studies indicate that forward falls are primarily prevented by stepping responses, with shorter steps aiding balance recovery and body weight influencing postural stability. This study investigates whether the body mass index (BMI) of subjects and therapists affects lean release angle and forward stepping characteristics, providing insights for clinical balance assessment and treatment.

Methodology: Thirty young adults (aged 18-26 years) without musculoskeletal injury history participated in this observational study. Forward lean-and-release tests followed BESTest guidelines, with video recordings analysed via Tracker software to measure lean angle (LA), first step length (FSL), first step time (FST), and base of support reduction distance (BRD).

Results: ANOVA revealed no significant differences in lean angle averages based on subject or therapist BMI ($p > 0.05$). However, 50% of participants showed notable lean angle variations.

Conclusion: While subject and therapist BMI may influence lean release angle in forward lean tasks, changes in FST, FSL, LA, and BRD did not reach statistical significance. Nonetheless, over 50% of the population exhibited meaningful average differences, warranting further investigation.

Keywords: Lean angle, BMI, postural control, forward stepping

Effectiveness of Reflection on Practice in the Performance of Activities of Daily Living

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Background: Reflection on practice provides time to reflect on a performance experience; this reflection serves to promote individual learning. This study looked at whether reflection on practice affects performance of the pegboard based motor task, which simulates activities of daily living (ADL), in normative adults 50–60 years.

Aim: To evaluate the effectiveness of reflection on practice in enhancing the performance of a pegboard-based motor task simulating activities of daily living among normal individuals aged 50–60 year.

Methodology: Participants first completed three trials of a pegboard task, completed a two-hour offline reflection period, and finally completed a fourth pegboard task trial. Performance was measured as the time taken to complete the task and the number of errors made. Prior to the pegboard task a review of the literature on reflection and motor learning.

Results: The participants improved significantly on the performance of the task after the offline reflection period, showing evidence of consolidation and learning.

Conclusion: Reflection on practice promotes improvements in motor performance and should be considered in rehabilitation efforts directed at increasing ADLs in the middle-aged population.

A Data-Driven Diagnostic Approach for Post-Stroke Unilateral Spatial Neglect Using Eyeball Tracking Data in VR Task Environments

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Background: Eyeball tracking data obtained during virtual reality (VR)–based tasks have been increasingly used to assess visuospatial attention deficits in patients with unilateral spatial neglect. However, despite the availability of high-dimensional behavioral data, there has been limited systematic investigation into how such data can be leveraged through data-driven diagnostic strategies in small clinical samples.

Methods: Eyeball and head movement data were collected from 12 healthy controls and 26 post-stroke patients during VR-based visual search and confirmation tasks. Unilateral spatial neglect was diagnosed using the Behavioral Inattention Test–Conventional (BIT-C), identifying 14 patients with neglect and 12 without neglect. A total of 812 spatiotemporal behavioral features were generated through structured feature engineering. Given the limited sample size, a statistical distance–based anomaly score framework was adopted using healthy controls as a normative reference. Feature-level diagnostic performance was assessed using univariate AUROC analysis and leave-one-out cross-validation (LOOCV). Ranked feature combinations were examined.

Results: Several eyeball tracking–derived features demonstrated strong discriminative performance (AUROC > 0.8). Three top-ranked features consistently maintained stable rankings across LOOCV iterations and captured complementary visuospatial behaviors of exploration bias, temporal adaptation, and fixation processing. Combining two or three features improved diagnostic performance, achieving 100% sensitivity. A fixation duration–related metric correlated with BIT-C scores, suggesting relevance to neglect severity.

Conclusion: In small-sample clinical settings data-driven exploration of eyeball tracking data can yield robust and clinically interpretable diagnostic results without reliance on complex black-box models. This framework supports VR-based diagnosis and future severity modeling of post-stroke unilateral spatial neglect.

Correlation of Modified Ashworth Scale and Modified Tardieu Scale with H-Reflex for Wrist Flexor and Plantar Flexor Spasticity in Patients with Stroke: A Pilot Study

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Background: This pilot study examined correlations between clinical spasticity scales Modified Ashworth

Scale (MAS) and Modified Tardieu Scale (MTS) and H-reflex parameters in assessing wrist flexor and plantar flexor spasticity in 10 stroke patients (mean age 42.67 years, mostly chronic phase).

Methods: A cross-sectional design at a tertiary center used convenient sampling, with assessments in morning hours: MAS for resistance to passive movement, MTS for velocity-dependent catch angles (R1, R2), and H-reflex (Hmax/Mmax ratio) via EMG for flexor carpi radialis and soleus excitability. Spearman correlations analyzed relationships.

Results: Wrist flexors showed non-significant correlations across measures (e.g., MAS-MTS r = 0.41, p = 0.23). Plantar flexors demonstrated significant associations: MAS-MTS (r = 0.70, p = 0.03), MTS-R2-R1 (r = 0.86, p = 0.002), though Hmax/Mmax lacked significance.

Conclusion: MAS and MTS validate for ankle spasticity assessment post-stroke, supporting muscle-specific protocols, while H-reflex integration needs larger studies for wrist utility in rehabilitation.

Keywords: Stroke, Spasticity, Modified Ashworth Scale, Modified Tardieu Scale, H-reflex

Convergent and Discriminant Validity of the Bimanual Assessment Measure Among Chronic Stroke Survivors: A Pilot Study

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Background and Objectives: Stroke survivors frequently experience persistent bimanual coordination deficits that impair daily activities, yet validated assessment tools for chronic phase upper limb function remain limited, particularly in Asian contexts. This pilot study evaluated the convergent and discriminant validity of the Bimanual Assessment Measure (BAM) against established measures in chronic stroke patients.

Methods: In this cross-sectional study, 19 right-hand dominant adults (>3 months post-unilateral stroke; mean age 54.3 ± 13.0 years) from a tertiary hospital underwent video-recorded assessments including BAM, Adult Assisting Hand Assessment (Ad-AHA Stroke), Jebsen-Taylor Hand Function Test (JTHFT), and ICF fine hand use components (d4400-d4403). Pearson correlations assessed BAM-Ad-AHA (convergent) and BAM-JTHFT (discriminant) validity; Spearman correlations examined BAM-ICF relationships ($p < 0.05$).

Results: BAM showed strong convergent validity with Ad-AHA ($r = 0.88$, $p < 0.001$). Discriminant validity was supported by moderate, non-significant negative correlation with JTHFT ($r = -0.37$, $p = 0.133$). BAM percentage scores negatively correlated significantly with ICF components: picking up ($r = -0.78$, $p < 0.0001$), grasping ($r = -0.66$, $p = 0.002$), manipulating ($r = -0.75$, $p = 0.0002$), releasing ($r = -0.51$, $p = 0.025$).

Discussion: BAM demonstrates robust validity for assessing bimanual hand coordination in chronic stroke, distinguishing it from unimanual dexterity measures while aligning with functional ICF activities. These preliminary findings support BAM's clinical utility in neurorehabilitation, warranting larger trials for broader applicability in diverse stroke populations.

Keywords: Stroke, Upper Extremity Function, Psychometrics, Motor Skills, Recovery of Function

3D Motion Capture Analysis of Wheelchair Propulsion Biomechanics: A Tool for Objective Movement Assessment and Its Future Scope in Rehabilitation and Performance Science

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Background: Various neurological conditions require use of manual wheelchair, which can have impact on the upper limb joints, spine and pelvis. Literature lacks a standardized and objective assessment technique for evaluating upper limb kinematics during wheelchair propulsion.

Three-dimensional (3D) motion capture system provides an objective quantification of movement patterns thereby providing detailed kinematic data and inter-segmental co-ordination. Its use in wheelchair propulsion can aid in evaluating, rehabilitation and help us in sports related injuries.

Aim: Study aimed to analyse the kinematics of manual wheelchair propulsion in a healthy individual using 3D motion capture system. It also aimed at creating a

foundation for evaluation and rehabilitation in athletes and its future scope in performance science.

Methods: Total of 53 reflective markers were placed on anatomical landmarks on upper limbs, trunk, pelvis and lower limbs and wheelchair. The participant performed three propulsion trials at self-selected speed. Kinematics data was recorded and processed to identify propulsion cycles. Joint angles, ranges of motion, and inter-segmental co-ordination patterns were analysed.

Result: The system captured and processed detailed kinematics of the upper limb across 3 propulsion trials. Various movement patterns, range of motion and co-ordination were identified at shoulder, elbow, wrist, trunk and pelvis. These findings demonstrated that 3D motion capture provides objective, reliable and repeatable data.

Conclusion: 3D motion capture system is a valuable tool for objectively assessing wheelchair propulsion biomechanics. Future scope includes better understanding in evaluating and rehabilitation of individuals and athletes in various wheelchair bound sports in Para-Olympics.

Effect of Unilateral/Bilateral Intention and Vision in Mirror Feedback-based Hand Therapy After Stroke

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Introduction: Mirror therapy is widely used in stroke rehabilitation to enhance motor recovery through visual feedback. However, the combined influence of movement type (unilateral vs bilateral) and visual conditions (direct vs mirror vision) on muscle activation, range of motion, and task immersion remains underexplored.

Aim: This study aims to examine the effects of different visual feedback and movement intention conditions on residual electromyographic (EMG) activity of the target hand muscles, joint range of motion, and subjective immersion in individuals with stroke.

Methodology: A within-subject experimental design was employed. Individuals with stroke (Modified Ashworth Scale 0–2; Medical Research Council score 0–2) participated in a single experimental session. Surface EMG electrodes were placed over the wrist flexor and extensor muscles using multi-pad electrodes. Wrist range of motion was recorded using an encoder-based device. Participants performed unilateral and bilateral wrist movements under direct vision and mirror vision conditions, guided by standardised audio cues. Cognitive function (MoCA), visuospatial neglect (Apples Test), Joint Position Sense (JPS), aphasia measurements, and task immersion (questionnaire) were also recorded as covariates.

Results: Preliminary analysis indicated condition-dependent variations in EMG activation, range of motion, and immersion scores, with mirror vision demonstrating enhanced voluntary muscle recruitment, more consistent task-related activation patterns, and greater subjective task engagement in several participants.

Conclusion: The findings suggest that visual feedback and movement conditions influence motor activation and subjective immersion in stroke survivors. These results support the relevance of mirror-based visual feedback in neurorehabilitation and provide insight for optimising task design in therapy.

NOARK: Not Just an Arm Skateboard—A Portable, Gamified Arm Skateboard for Upper-Limb Rehabilitation

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Introduction: Stroke often results in upper-limb weakness, and arm skateboards are commonly used as mobility devices for post-stroke upper-limb rehabilitation. However, conventional arm skateboards, while simple and inexpensive, lack movement-sensing capabilities. As a result, participants receive no feedback during training, which can lead to boredom, poor adherence to therapy, and ultimately poor recovery.

To address these issues, we developed NOARK (Not Just an Arm Skateboard), a specially designed arm skateboard that supports both planar and 3-Dimentional movement.

Aim: The objectives of this study are to validate the accuracy of NOARK's position estimation and to design and develop software for assessing users' active workspace, as well as games to improve engagement during NOARK-based therapy.

Methods: NOARK is equipped with a camera-based tracking system that continuously estimates its position

and orientation using strategically placed fiducial markers. The accuracy of NOARK's position estimation was validated against an 8-camera OptiTrack motion capture system. This tracking information is used to provide gamified feedback to participants during therapy. Furthermore, games and assessment software were developed using the Godot game engine.

Results: NOARK's position-tracking algorithm yielded acceptable results, with maximum-absolute-errors of 0.4 cm, 0.2 cm, and 1.8 cm along the X, Y, and Z axes, respectively.

Conclusion: NOARK provides a simple and effective platform for delivering therapy and for analysing upper-limb movements. The developed software enables quantitative assessment of active workspace and includes games that train patients in anterior–posterior, mediolateral, and targeted reaching tasks. This contrasts with conventional arm skateboards, which allow largely random movement without feedback.

Multi-Channel Emg to Detect Movement Intention in Severely Impaired Stroke Patients with No Visible Movement

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Introduction: Robot-assisted therapy contingent on movement intention promotes active engagement, which is essential for sensorimotor recovery after stroke. However, detecting movement intention in severely impaired stroke patients with no visible movement is challenging. While EEG-based brain-computer interfaces have been explored, surface electromyogram (EMG) offer a potentially simpler alternative, provided that residual muscle activity can be reliably detected.

Aim: To screen severely impaired stroke patients with no visible movement for residual EMG using multichannel high-density EMG (HD-EMG).

Methods: Five stroke patients unable to actively extend the wrist (Medical Research Council score < 2) participated in a single recording session. HD-EMG signals were acquired using a Quattrocento amplifier, OT Bioelettronica and two 64-channel electrode grids in 8x8 configuration placed over the wrist flexor and extensor muscles. Participants were instructed to alternately flex and extend the wrist following a "move" cue and to relax during a "relax" cue. A modified hodges detector was used to map raw EMG signals to a binary signal. Residual EMG was considered present when detection probability during the move period exceeded that of the relax period. The channel with maximum separation between these probabilities, quantified using the probability difference sum ratio (PDSR), was used for this purpose.

Results: Detectable residual EMG was identified in three participants, with different specific patterns of muscle activity across subjects.

Conclusion: Multichannel HD-EMG can effectively detect weak residual muscle activity in severely impaired stroke patients and may inform the design of effective EMG-driven robot-assisted rehabilitation interventions.

Lights for Epilepsy: Photobiomodulation as an Adjunct to Speech-Language Therapy to Boost Cognitive-Communication, Attention, Executive Function, and Functional Outcomes in Individuals with Epilepsy Undergoing Structured, Evidence-Based Rehabilitation Programs

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Cognitive-communication deficits often persist in individuals with epilepsy despite pharmacological management. Photobiomodulation (PBM), a non-invasive red to near-infrared neuromodulation technique, has demonstrated neuroprotective and pro-cognitive effects in experimental epilepsy, yet its integration with speech-language therapy remains limited. This study evaluated the effect of adjunct PBM on cognitive-communication outcomes in individuals undergoing speech-language rehabilitation. A prospective within-subject interventional design was employed, with participants serving as their own controls. Individuals with epilepsy who had completed at least 12 months of structured speech-language therapy,

exhibited persistent attention and executive function deficits, and maintained a stable antiepileptic regimen were included. Exclusion criteria encompassed recent neurosurgery, uncontrolled systemic or neurological illness, photosensitivity, severe psychiatric instability, or inability to comply with the intervention. Participants continued weekly speech-language therapy while receiving daily PBM for three months (20–30 minutes per session, 5–7 days per week) following standardized safety protocols. Speech therapy targeted attention, executive functioning, language organization, and functional communication. Cognitive-communication performance was assessed at baseline and post-intervention using the Montreal Cognitive Assessment (MoCA) and structured clinical observations. Within-subject repeated measures analyses compared pre- and post-PBM outcomes, with statistical significance set at $p < 0.05$. Primary outcomes included total MoCA scores and attention/executive subdomain performance. Results are expected to demonstrate the additive benefit of PBM in enhancing cognitive-communication skills in adults with epilepsy, providing preliminary evidence for its integration as a neuromodulatory adjunct to clinical speech-language therapy. This study highlights the potential of combining non-invasive photomodulation with conventional rehabilitation to optimize attention, executive functioning, and overall functional communication.

Why Must the Transition from a Walker to Crutches be Traumatic? Introducing Magnovac: A Play-Based Training Device Designed to Support Active Rehabilitation for Children with Cerebral Palsy

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Introduction: Transitioning from a walker to crutches or a walking stick often causes fear and stress for children with Cerebral Palsy (CP) during gait training. The fear of falling can make this experience traumatic. This project attempts to mitigate these challenges by integrating play to encourage participation and reduce anxiety.

Aim: To develop Magnovac, a device facilitating a smooth transition from a walker to a walking stick for children with CP and motor delays.

Methodology: Magnovac is a modular pediatric mobility aid designed to bridge the gap between stable walkers and unstable walking sticks. Engineered to evolve alongside a child's motor abilities, its handle supports both unilateral and bilateral configurations based on the user's balance, while telescopic adjustments accommodate children of different heights. An articulating shaft with a clear degree indicator allows for angle adjustments (0–90°), enabling therapists to tailor training specifically to the child's trunk and upper-limb functionality. Options to challenge the user's balance are fully customizable: a detachable "tail" and extendable wheels allow the therapist to progressively reduce the base of support, while internal weights and a screw mechanism provide progressive resistance. Uniquely, a magnetic core transforms therapy into play, enabling children to collect magnetic pegs during ambulation. Finally, the device's outer shell, modelled here as a "black bug," features interchangeable animal designs, converting rigorous rehabilitation into an engaging, child-friendly experience.

Conclusion: Qualitative feedback from both therapists and children was largely positive. We are planning future large-scale trials to determine its efficacy in improving pediatric gait training.

Exploring the Impact of Lesion Site, Side and Extent on Ipsilesional Sensory Deficits in Ischemic Stroke Patients

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Background: Stroke is a major cause of disability, and it is most common to expect some level of sensory loss on the affected side, there is some research indicating that sensory loss may also occur on the "unaffected" side. The present study highlights how stroke affects sensation in the ipsilesional limb.

Aim: To analyse the impact of lesion profile on sensory deficit in the ipsilesional side in ischemic stroke patients.

Methodology: Thirty ischemic stroke patients [18–80 years] were recruited. Ipsilesional sensory deficits were assessed using the Revised Nottingham Sensory Assessment [NSA], and lesion profiles analysed with ASPECTS. Demographics, history, lesion characteristics was recorded. Sensory parameters were analysed, and associations between lesion profile and ipsilesional sensory deficits was statistically examined.

Results: Ipsilesional sensory deficits were observed in patients with different lesion locations. The result shows that ipsilesional sensory deficits were observed across all lesion types—cortical, subcortical, and trans cerebral. Cortical lesions, especially in frontoparietal regions, showed the most severe impairments in light touch, temperature, and pressure. Subcortical lesions caused milder deficits.

Conclusion: This study shows how lesion site and side may relate to ipsilesional sensory impairments. Clinical observations suggest that larger or critically located lesions may still influence sensory outcomes. These exploratory results highlight the need for further research with larger sample sizes. Importantly, they emphasize the need for bilateral sensory examination as a routine part of post-stroke assessments to uncover latent abnormalities, customize rehabilitation, and improve functional outcomes and quality of life for stroke patients, bilateral screening is crucial.

Weight Bearing Asymmetry Patterns in Patients with Stroke: A Systematic Review

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Introduction: Stroke frequently leads to weight-bearing asymmetry (WBA), a prevalent motor impairment that compromises postural control, gait performance, and increases fall risk. Understanding common asymmetry patterns and reliable assessment tools is essential for individualized stroke rehabilitation.

Aim: This systematic review aimed to synthesize evidence on patterns of weight-bearing asymmetry in individuals with stroke and to identify the tools used to assess and quantify these asymmetries.

Methodology: The review followed PRISMA guidelines. A systematic search of PubMed and Google Scholar was conducted for randomized controlled trials published between 2015 and 2025. Search terms included stroke, hemiplegia, weight bearing, postural control, postural sway, asymmetry patterns, and measurement methods. Eligible studies involved individuals with stroke, used objective measures of WBA, and reported asymmetry patterns and assessment tools. Data were extracted on asymmetry types, measurement methods, and intervention approaches.

Results: Seven randomized controlled trials involving approximately 266 participants were included. Common WBA patterns were increased loading on the non-paretic limb, lateral weight shift, and reduced paretic limb loading during static and dynamic tasks. Assessment tools included force platforms, GAITRite systems, weight-bearing scales, and clinical balance measures. Interventions such as insoles, weighted gait training, symmetry-focused sit-to-stand training, ankle–foot orthoses, shoe lifts, tilt-based training, and weight-shift–triggered electrical stimulation improved symmetry indices and functional outcomes. Force platforms and symmetry indices demonstrated the highest reliability.

Conclusion: Accurate assessment of weight-bearing asymmetry using objective tools, combined with targeted interventions, can enhance postural control, gait symmetry, and functional recovery.

Correlation Between Weight Bearing Measures & Weight Distribution Patterns with Clinical Measures such as TUG, FRT, Push Pull Test in Individuals with Stroke – A Pilot Study

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Introduction: Balance impairments after stroke are frequently associated with altered weight-bearing strategies, including asymmetrical loading and uneven weight distribution. Although weight-bearing asymmetry is commonly evaluated in clinical practice, its association with functional balance and mobility outcomes remains inconsistent.

Aim: To examine the relationship between weight-bearing asymmetry measures and weight-distribution patterns (even and uneven loading) with clinical measures of balance and functional mobility in individuals with stroke.

Methodology: This cross-sectional pilot study included 19 individuals with chronic stroke (mean age 51.4 ± 13.0 years) recruited from a tertiary care hospital. Weight-bearing asymmetry and symmetry thresholds were assessed using dual digital weighing scales and the BOBO Pro Balance System. Weight distribution was classified as even or uneven loading. Functional mobility, dynamic balance, and reactive postural control were assessed using the Timed Up and Go test (TUG), Functional Reach Test (FRT), and Push–Pull test.

Pearson's correlation analysis was performed to determine associations between weight-bearing measures and clinical outcomes ($p < 0.05$).

Results: Weight-bearing asymmetry demonstrated weak and non-significant correlations with TUG, FRT, and Push–Pull test scores. Uneven weight distribution showed a strong negative correlation with Push–Pull test performance ($r = 0.72$, $p = 0.013$), whereas even weight distribution demonstrated a significant positive correlation with TUG performance ($r = 0.71$, $p = 0.049$). Other correlations were low and non-significant.

Conclusion: Weight-distribution patterns appear to provide greater clinical insight into dynamic and reactive balance performance than weight-bearing asymmetry alone. Despite the small sample size, these findings support the feasibility of objective weight-distribution assessment and warrant.

Predicting Convergent and Discriminant Validity of Bimanual Assessment Measure: Study Protocol

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Background: The Bimanual Assessment Measure (BAM) is an emerging measure that was created recently to assess bimanual hand function and coordination in patients with stroke. Though its reliability has been established in short period of time since its development, convergent and discriminant validity has not been investigated yet.

The purpose of this study is to validate BAM by comparing its outcomes with established assessment tools. Demonstrating its validity will enhance its clinical applicability, ensuring a reliable and standardized method for evaluating bimanual hand function in stroke patients, ultimately contributing to improved rehabilitation strategies.

Methods: This observational study will assess the convergent and discriminant validity of the Bimanual Assessment Measure (BAM) in patients with Stroke. Assessment tools including the Jebsen-Taylor Hand Function Test (JTHFT) utilized to evaluate unimanual capability and the Adult Assisting Hand Assessment (AD-AHA), will be administered alongside BAM to evaluate bimanual hand function.

For determining Convergent Validity, BAM scores will be compared with AD-AHA to determine its validity in assessing bimanual coordination in stroke patients. For investigating Discriminant Validity, BAM scores will be compared with JTHFT scores. This study's secondary goal is to compare unimanual capacity (assessed through JTHFT) and bimanual hand function (assessed through BAM) to understand the relationship between these two aspects of upper limb performance.

Discussion: The results of this investigation will shed light on the Convergent and Discriminant validity of the Bimanual Assessment Measure (BAM) in stroke patients, contributing to its clinical applicability for evaluating bimanual hand function and coordination in rehabilitation settings.

Development and Validation of Primitive Reflex Video Module for Enhancing Clinical Reasoning Among Physiotherapy Students

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Background: There is a critical need for standardized, clinically accurate training resources on primitive reflex assessment for physiotherapy students. Existing online videos are heterogeneous, unregulated, and often lack clear explanation of stimulus, response, developmental timelines, grading, and interpretation, causing inconsistent learning. An expert validated video module provides structured, competency-based learning, improves examination confidence and accuracy, and effectively bridges the gap between classroom theory and real paediatric neurorehabilitation practice.

Methodology: A mixed-method study developed expert-validated PowerPoint modules for primitive reflex assessment. Videos from paediatric patients at a tertiary hospital and neurorehabilitation OPD were classified into four neurological levels (spinal cord, brainstem, midbrain, automatic reactions). Modules detailed testing position, stimulus, response, and developmental timelines. Five specialists validated content using a 10-item checklist across three domains (Reflex ID, Assessment Technique, Technical Quality) with 5-point Likert ratings. Item-Level Content Validity Index (I-CVI 0.80) confirmed content validity.

Result: Expert validation achieved good content validity: I-CVI ranged 0.60–1.00 (mean 0.86), with 80% of items meeting I-CVI 0.80 threshold. Domain 1 (Reflex ID) and

Domain 2 (Assessment) showed excellent agreement (I-CVI 0.87), while Domain 3 required minor technical refinements. Three experts fully endorsed technical quality, while two suggested improvements in camera angles and lighting. All experts agreed the videos are educationally valuable.

Conclusion: The resource achieved expert consensus validation, demonstrating strong content validity and clinical applicability, with minor technical refinements expected to further optimize its use in training and early identification of neurodevelopmental disorders.

What is "Normal Balance" in the Indian Population?

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Introduction: Balance control is fundamental to human stability and mobility. Impaired balance elevates the fall-risk and induces long-term disability; therefore, assessing balance is essential. However, a quantitative reference that distinguishes the normal from impaired balance without any subjective judgement of clinician is lacking for the Indian population.

Aim: We propose a well-structured protocol to conduct a study on healthy Indian adults for establishing a sway-based normative dataset for static-balance across lifespan under varied visual, somatosensory, and base-of-support conditions.

Methodology: Healthy adults aged 18–85 years will be locally recruited and stratified into three age groups: young (18–34 years), middle-aged (35–59 years), and older adults (60–85 years). Based on effect sizes reported in prior study focused on age-group comparisons of quiet-stance sway, a sample size of 100 per group was determined to ensure 90% power at 95% confidence level. Interested participants will be screened for eligibility through basic cognitive, sensory-motor, and balance-mobility assessments. Eligible subjects will perform static postural tasks while standing barefoot on force platforms under altered visual (eyes-open and eyes-closed), somatosensory (firm and foam surface), and base-of-support (regular and narrow) conditions, including limit-of-stability tasks. Center-of-pressure and weight-distribution parameters will be obtained to establish age-dependent normative sway data. Additionally, a statistical machine-learning–based normative model will be developed to quantify the influence of demographic factors (age, BMI) and predict individualized balance performance.

Conclusion: The outcome of the proposed study will provide a reference to identify balance deterioration, assess rehabilitation progress in balance, and guide targeted-clinician-independent interventions for balance in Indian population.

Four-Year Longitudinal Follow-Up of Limb-Girdle Muscular Dystrophy Type 2B with Physiotherapy Rehabilitation: A Case Report

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Background: Limb-girdle muscular dystrophy type 2B (LGMD2B), caused by dysferlin gene mutations, is an uncommon degenerative neuromuscular condition with insufficient data on long-term physiotherapy outcomes.

Case Presentation: A 28-year-old man with bilateral lower limb weakness and ambulatory impairment was found to have genetically confirmed LGMD2B. He had systematic physical therapy two to three times a week from 2021 to 2025, which included aerobic conditioning, low-intensity strength training, functional mobility exercises, and contracture prevention.

Results: One of the most notable early improvements was a 37% rise in the six-minute walk distance (6MWD; 161.5 m to 222 m peak). At 48-month follow-up, 6MWD stabilized at 185 m (+14.6% net from baseline), retaining ambulation. Strength in the upper extremities increased and remained stable (4/5 to 5/5 bilaterally). Heterogeneous patterns were revealed by manual muscle testing: ankle muscles remained very weak, but knee flexors advanced (1+ to 2–/5). Activities of daily living remained stable, with improved walking function.

Conclusion: Long term Physical Therapy prevented functional loss, retained upper limb independence, and maintained ambulation despite the unstoppable progression of LGMD2B. This story emphasizes the importance of rehabilitation for rare neuromuscular disorders for whom there are no treatments.

Correlation Between Working Memory and Lower Limb Motor Coordination in Community-Dwelling Elderly: A Cross-Sectional Study

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Background: Ageing is associated with a progressive decline in cognitive and motor functions, which may affect balance, mobility, and independence in older adults. Working memory and lower limb coordination are essential for safe functional mobility; however, their relationship in healthy elderly individuals remains unclear.

Aim: To determine the correlation between working memory and lower limb motor coordination in community-dwelling elderly adults.

Methodology: This cross-sectional observational study included 51 community-dwelling adults aged 60–80 years. Working memory was assessed using the Digit Span Test, and lower limb motor coordination was evaluated using the Lower Extremity Motor Coordination Test (LEMOCOT)[non equilibrium co-ordination test] for both right and left lower limbs. Individuals with cognitive impairment, depression, or neurological, musculoskeletal, or cardiovascular disorders were excluded. Data normality was assessed using the Kolmogorov–Smirnov test, and Pearson's correlation coefficient was used to examine associations between Digit Span scores and LEMOCOT performance.

Results: The mean age of participants was 66.72 ± 5.59 years. Mean LEMOCOT scores were 22.35 ± 5.78 for the right limb and 22.49 ± 6.27 for the left limb, while the mean Digit Span score was 3.55 ± 1.75. Weak positive correlations were observed between working memory and right ($r = 0.17$, $p = 0.24$) and left lower limb coordination ($r = 0.21$, $p = 0.27$), with no statistically significant associations.

Conclusion: Working memory showed a weak, non-significant association with lower limb motor coordination, suggesting relative independence of these domains and supporting separate assessment and targeted interventions in neuro-geriatric rehabilitation.

From Diagnosis to Function: A Rule-Governed Generative AI for Standardized ICF-Based Neurological Reporting

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The ICF Functional Report Assistant is a purpose-built generative AI system designed to support standardized, function-focused clinical reporting using the World Health Organization's International Classification of Functioning, Disability and Health (ICF). In neurological practice, where impairments often span body functions, activities, participation, and environmental context, consistent functional documentation remains challenging. This GPT addresses that gap by transforming clinician-entered information into a structured, transparent ICF-based functional report.

The system strictly relies on explicitly provided clinical data and does not diagnose, infer pathology, or introduce unsupported assumptions. It applies relevant WHO ICF Core Sets when a health condition is specified, assigns ICF codes and numeric qualifiers conservatively, and documents environmental factors as facilitators or barriers. Outputs are standardized into six sections—Body Functions and Structures, Activities, Participation, Environmental Factors, Personal Factors, and a Summary Functional Statement—with tabulated clinical reasoning to enhance interpretability and auditability.

By prioritizing function over diagnosis, the assistant aligns with contemporary neurorehabilitation principles and supports interdisciplinary communication, outcome tracking, and research comparability. This tool demonstrates how constrained, rule-governed generative AI can augment clinical workflows while preserving clinical responsibility, international standards, and ethical use. The ICF Functional Report Assistant represents a scalable approach to embedding a shared functional language into neurological care, education, and research across global contexts.

Exploring the Implementation Outcomes and Challenges in Tele-Rehabilitation of Stroke Survivors in Low-Resource Settings

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Tele-rehabilitation is a helpful approach to extend rehabilitation services to stroke patients in the community. However, its implementation in low-resource settings has been challenged by infrastructure limitations, digital literacy, and socioeconomic barriers. Once these challenges are understood, a sustainable telerehabilitation model for community-dwelling stroke survivors in the low-resource setting can be developed.

Aim: To explore the implementation outcomes, patient engagement patterns, and contextual factors challenging the delivery of telerehabilitation to community-dwelling stroke survivors living in low resource setting.

Methods: Mixed-method observational study. Subjects: 40 community-dwelling stroke survivors and 10 physiotherapists engaged in low-tech tele-rehabilitation programs.

Procedure: Subjects were selected conveniently, and a booklet of printed weekly home exercise plans was distributed. Reminders were given for doing exercises, using mobile phone calls, and SMS. Implementation outcomes were assessed using the Implementation Outcome Framework proposed by Proctor et al., focusing on acceptability, feasibility, fidelity, and sustainability. Additional Semi-structured interviews were conducted to explore the barriers and facilitators influencing participation. Quantitative data were analyzed statistically, and qualitative responses thematically. Results Tele-neurorehabilitation demonstrated high acceptability (82%) and moderate feasibility (71%), with strong patient–therapist rapport maintained through phone contact. Key enablers included caregiver involvement, flexible scheduling, and low-cost accessibility. Major challenges were network issues, call connectivity, low digital literacy, and caregiver burden. Qualitative findings pointed out a need for context-specific support and simplified user interfaces.

Conclusion: Tele-neurorehabilitation was found to be both feasible and acceptable in low-resource settings when tailored to local contexts and supported by caregivers.

Keywords: Tele-neurorehabilitation, stroke survivors, low-resource settings

Impact of Advanced Technologies Integrated with Physiotherapy in Spinal Cord Injury Rehabilitation: A Narrative Synthesis of Quantitative Evidence

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Background: Spinal cord injury (SCI) results in persistent motor, sensory, and functional impairments that limit independence and quality of life. While conventional physiotherapy remains central to rehabilitation, recent advances in technology have expanded therapeutic options aimed at enhancing neuroplasticity and functional recovery. This narrative review synthesizes quantitative evidence on advanced technology–assisted physiotherapy interventions in SCI rehabilitation.

Methods: Literature from systematic reviews, meta-analyses, clinical trials was analysed to compare outcomes associated with robot-assisted gait training (RAGT), wearable exoskeletons, functional electrical stimulation (FES), and virtual reality (VR) along physiotherapy. Key outcomes included walking performance, lower-limb motor function, balance, and ADL

Results: RAGT demonstrated consistent improvements in gait and functional outcomes, with moderate effect sizes reported for walking distance and lower-limb strength, particularly in individuals with incomplete or subacute SCI.

Wearable exoskeletons showed moderate to large effects on gait performance and motor scores, including significant improvements in the 6-minute walk test, 10-meter walk test, balance, and functional independence measures.

FES emerged as particularly effective in enhancing gait velocity and endurance, supporting muscle activation and cardiovascular benefits.

VR-based rehabilitation improved balance, motor control, aerobic capacity, and patient engagement, although evidence quality was variable.

Conclusion: Advanced technologies integrated with physiotherapy enhance functional outcomes in SCI rehabilitation, with RAGT and exoskeletons demonstrating stronger evidence for gait and motor recovery, while FES and VR provide complementary benefits. An individualized, goal-oriented approach combining conventional therapy with appropriate technological interventions may optimize rehabilitation outcomes. Further high-quality studies are needed to establish standardized clinical guidelines.

Telerehabilitation for Upper Limb Recovery After Stroke: Effectiveness, Functional Outcomes, and Clinical Challenges

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Background: Stroke is a leading cause of adult disability, with nearly 85% of survivors experiencing persistent upper limb impairments, particularly in distal joints. Limited access to long-term, in-person rehabilitation has increased interest in technology-based and telerehabilitation approaches. However, consolidated evidence on functional outcomes and clinical applicability remains limited.

Objective: To evaluate the effectiveness of telerehabilitation for upper limb recovery in stroke survivors and its role in addressing functional and clinical challenges in outpatient rehabilitation settings.

Methods: A comprehensive literature search was conducted across PubMed, Web of Science, Scopus, Embase, and Google Scholar using the PICOS framework. Systematic reviews and case studies involving adult stroke patients aged 25–70 years undergoing telerehabilitation-based upper limb interventions were included.

Results: From 1,482 screened articles, reviews encompassing 83 studies with 2,393 participants (mean age: 54 years) were analyzed. Interventions included telerehabilitation platforms, mobile applications, virtual and augmented reality, and wearable devices. Improvements were observed in upper limb motor function, ADL participation, and patient engagement. Outcome measures such as the ARAT and PROMs demonstrated positive changes. Telerehabilitation was found to be feasible, cost-effective, and suitable for long-term rehabilitation, particularly in Indian OPD settings.

Conclusion: Telerehabilitation is an effective and accessible adjunct to conventional therapy for upper limb recovery after stroke, enhancing functional outcomes and continuity of care.

Not Perfection but Presence and Satisfaction: A Case Study Demonstrating the Impact of PREP Informed Ideas in Pediatric Physiotherapy

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Introduction: Participation, defined by International Classification of Functioning, Disability and Health (ICF) as involvement in life situations, is a key outcome of pediatric rehabilitation. The Pathways and Resources for Engagement and Participation (PREP) is an evidence-based, participation-focused pediatric intervention approach that targets environmental factors to enhance participation.

Aim: To demonstrate the impact of integrating PREP with physiotherapy to enhance participation in home settings.

Methods: Informed consent was obtained from caregivers of a 6-year-old child with Joubert syndrome, presenting with neuromuscular impairments and classified at Gross Motor Function Classification System level III. In addition to the impairment-based physiotherapy targeting postural control and balance, the five PREP steps were implemented in partnership with the family.

Results: PREP step one involved identification of a participation-based goal focused on standing while engaging in a religious family activity. Step two comprised assessment of home environment across physical, social, and attitudinal domains to inform intervention planning. In step three, environmental modifications were implemented, including installation of low-cost parallel bars to support standing, caregiver coaching, provision of encouragement, and rest breaks. Step four involved outcome evaluation using Canadian Occupational Performance Measure (COPM). Baseline COPM performance and satisfaction scores were 3/10 each. After 10 weeks, endline COPM scores improved to 5/10 for performance and 7/10 for satisfaction. Step five was evidenced by increased participation in community activities as noted with qualitative feedback.

Conclusion: Emphasizing attendance and involvement rather than only independence reinforces participation within an ICF-aligned framework.

Persistence of ATNR and STNR Primitive Reflexes and Their Association with Motor Function in Healthy Children and Children With Neurodevelopmental Conditions: A Systematic Review

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Introduction: Primitive reflexes such as asymmetrical tonic neck reflex (ATNR) and symmetrical tonic neck reflex (STNR) aid early motor development and typically integrate in early childhood. Persistence beyond age-appropriate periods associates with altered motor performance, varying by typically developing versus children with neuro-developmental condition.

Objective: To report persistent ATNR/STNR relationships with motor abilities in healthy versus children with neuro-developmental condition.

Methods: Systematic search of PubMed, Scopus, Web of Science, CINAHL identified observational studies assessing ATNR/STNR with motor outcomes in typically developing and neurodevelopmental condition groups.

Outcomes: postural control, balance, gait, coordination, fine/gross motor milestones. Narrative synthesis done, as heterogeneity in designs, assessments, ages, measures.

Results: In typically developing children (6 weeks–8 years), infancy studies showed weak associations between primitive reflex presence and motor milestones (r 0.10–0.20). From preschool age onward, persistent ATNR and STNR showed significant inverse associations with balance, postural stability, coordination, fine motor precision, and gait symmetry (r –0.30 to –0.54; pelvic asymmetry–0.25 to –0.43). In children with neuro-developmental conditions (neonatal to adolescence), retained ATNR and STNR were consistently associated with delayed gross motor milestones, impaired trunk control, reduced standing, walking abilities, poorer balance reactions, lower gross motor function scores (r –0.45 to 0.49).

Conclusion: Persistent ATNR and STNR are associated with subtle motor inefficiencies in healthy children but with clinically meaningful motor impairments in children with neuro-developmental condition. Reflex persistence should be interpreted contextually, with greater clinical relevance in the later cohort to also provide scope for early intervention.

Impact of Early Intensive Neurophysiotherapy on Functional Recovery in Acute Hemorrhagic Stroke: A Case Report

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Introduction: Acute hemorrhagic stroke often leads to severe motor and functional impairments, especially in patients undergoing neurosurgical procedures such as craniotomy. Early initiation of intensive neurophysiotherapy during the acute phase is essential to enhance neuroplasticity, reduce secondary complications, and improve functional outcomes.

Aims: To report the impact of early and intensive task-specific neurophysiotherapy on functional recovery in a patient with acute hemorrhagic stroke following craniotomy and continued through the cranioplasty phase.

Methodology: This case report describes a 49-year-old female with acute left-sided hemiplegia secondary to hemorrhagic cerebrovascular accident, status post emergency craniotomy. Neurophysiotherapy rehabilitation was initiated immediately in the acute postoperative phase and continued consistently through cranioplasty. The patient underwent an intensive, task-specific neurophysiotherapy program for two months, five sessions per week, focusing on early mobilization, tone normalization, trunk control, motor relearning, balance training, and high-repetition functional tasks. Outcome measures including the Fugl–Meyer Assessment, Manual Muscle Testing, Trunk Control Assessment, and Functional Independence Measure were recorded pre- and post-intervention.

Results: Post-intervention assessment demonstrated marked improvements in motor control, trunk stability, balance, and functional independence across all outcome measures, despite severe neurological deficits at baseline.

Conclusion: This case demonstrates that very early and continuous intensive neurophysiotherapy initiated during the acute phase of hemorrhagic stroke, even following neurosurgical intervention, can result in significant functional recovery. Early integration of task-specific rehabilitation should be considered a key component of acute stroke management.

Suitability and Usability Evaluation of Hypercube – A Multi-functional Sensor-Based Device for Hand Neurorehabilitation

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Introduction: Following a cerebrovascular accident (CVA), hand motor impairment often results in dependence in daily activities. While conventional rehabilitation improves function through intensive task-oriented therapy, it requires multiple tools to train the prehensile and non-prehensile function of the hand. A single device for both clinical and home training is ideal. HyperCube, developed by the Department of Bioengineering at CMC Vellore, is a multi-functional, sensor-based, cube-shaped hand training device with distinct training mechanisms on each face.

Aim: The objective of this study is to evaluate HyperCube's usability and feasibility in persons with hand impairments following a CVA/Stroke.

Methodology: This pilot study will evaluate HyperCube usability in 15 clinical staff, and 50 adults (>18yrs) with post CVA / Stroke, with various degrees of impairment in their affected hand with a MoCA score of 26. People with chronic pain on the affected side (VAS >3/10) will be excluded. The study will be carried out in three phases. Phase 1 – Clinical staff will evaluate the HyperCube prototype and provide feedback on usability design. Phase II – Design refinement and clinician usability assessment using the System Usability Scale (SUS). Phase III – CVA/ stroke patients with impaired hand function will undergo clinical screening and usability evaluation; Participants able to use at least one mechanism will be deemed suitable and will complete brief training and SUS-based usability assessment, with optional clinician observation.

Conclusion: This study will identify stroke survivors suitable for HyperCube-based hand neurorehabilitation and evaluate its usability with clinicians and patients.

Evaluating the Generalizability of Activity Recognition Models: From Healthy Adults to Hemiparetic Stroke Survivors

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Introduction: Continuous, objective monitoring of Activities of Daily Living (ADL) of stroke survivors facilitates personalized, data-driven plans for improved upper-limb use.

Practical difficulties in collecting patient data have led to reliance on more accessible healthy-subject datasets for activity recognition. However, it is critical to evaluate the generalizability of these models to identify which specific activities can be accurately predicted in stroke patients using healthy-subject training data before real world deployment.

Aim: To evaluate the generalizability of an activity recognition model trained on healthy subject data in hemiparetic stroke patients of varying levels of severity.

Methodology: Five healthy individuals and three hemiparetic individuals performed a set of daily life activities wearing an IMU sensor band on their right wrist (affected and unaffected limbs). A hybrid Random Forest and Hidden Markov Model (HMM) was used for training healthy subject data, leaving one subject out for cross validation. The model was assessed using patient data after it had been trained and validated.

Results: Highest accuracy was obtained for healthy dataset followed by unaffected and affected side of patients. Distinct activities such as walking and brushing were recognized the most accurately: however, low-intensity tasks showed significant overlap and misclassification. In particular, the model sensitivity on the hemiparetic side was reduced as the impairment severity increased.

Conclusion: The study demonstrates that machine learning models trained on healthy subjects are partially transferable to stroke populations. The results suggest that "one-size-fits-all" normative models may be insufficient for paretic limb monitoring.

Factors Influencing the Amount of Practice During Upper Limb Task-Oriented Training in Sub-Acute Stroke-A Secondary Analysis of Data from a Randomized Controlled Trial

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Introduction: Intensive high-repetitive practice is one of the strategies implemented during task-oriented training (TOT) to improve neural plasticity in people with stroke. While a high dosage of 300 repetitions in a one-hour session of upper limb TOT is feasible, we observed considerable variability in the implementation of the intended dose in our trial. We hypothesize that multiple factors may influence the feasibility of implementing high-dose practice during TOT. Therefore, this study aimed to identify the factors influencing the delivery of high-dose practice during upper limb TOT in people with stroke.

Methods: Thirty-three sub-acute stroke participants were included. We analysed the relationship between several independent variables (age, sex, stroke type, lesion site and size, stroke duration, severity of arm impairment, spasticity, and depression) and the mean number of repetitions (dependent variable) using stepwise multiple linear regression.

Results: Among all variables, the Severity of arm impairment was the only significant predictor of the amount of practice ($r= 0.804$; $p < 0.001$). Individuals with severe arm impairment (SAFE score <5) performed an average of 95 repetitions, and those with mild to moderate impairment (SAFE score >5) completed 222 repetitions in a one-hour session. Other variables showed weak correlation. The regression model was statistically significant. [$F (1,31) = 56.449$; $p < 0.001$], explaining 63.4% of the variance in repetitions ($R2=0.646$, Adjusted $R2 = 0.634$, SEE = 5 3.979).

Conclusion: Severity of arm impairment was the only factor influencing the feasibility of delivering high-dose, therapist-guided, supervised upper limb task-oriented training in people with sub-acute stroke.

Keywords: cerebrovascular disease, task-specific training, dosage, upper extremity

Effect of Cognitive Exercises Combined with Conventional Exercises on Balance in Healthy Geriatric Population

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Introduction: Walking is not merely an automatic biomechanical process; it also requires cognitive input to adapt to changing environmental stimuli and in case of postural perturbations – to recover balance and avoid falls. Falls are a major consequence of aging and remain a leading cause of morbidity and mortality in geriatric population.

Aim: This study aims to compare the effects of conventional training alone versus cognitive exercises combined with conventional training on balance in healthy older adults.

Method: 40 young old geriatric adults (aged 65–74 years; mean age: 68.27, SD: 2.86) who were independent walkers were included in the study. Participants with any existing musculoskeletal, neurological and other systemic illness affecting balance or cognition were excluded. were randomly assigned to Group A – received conventional Otago exercise program, and Group B – received Otago exercise program plus self-tailored cognitive exercises targeting attention, perception, memory and processing speed components of cognition. Both the groups received 12 alternate sessions over a span of 4 weeks. Balance was assessed using MiniBESTest and Walking While Talking Test (WWTT-Simple and Complex) at baseline and post intervention.

Result: Both the groups when compared showed clinical but no statistical significance with a p value = 0.118 for MiniBESTest, p value = 0.072,0.120 for WWTT-Simple and WWTT-Complex, respectively. However, intra-group analysis statistically showed significant improvement on MiniBESTest scale, where Group B's performance was better than Group A.

Conclusion: Thus, inculcating cognitive exercises to conventional balance training enhances balance in older adults.

Feasibility and Clinical Utility of Structured Tele-Consultation Using Caregiver-Administered Scales in Post-Stroke Rehabilitation: A Prospective Observational Study from a Rural Region of India

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Stroke is a major cause of long-term disability in both rural and urban populations, with recovery often more limited in rural settings due to health system and social factors such as limited awareness regarding post-stroke care, inadequate transport infrastructure, severe physical disability associated with increased ambulance costs, difficulty in arranging accompanying caregivers, and challenges in regular monitoring of vascular risk factors. In addition, the use of unregulated local treatments may delay appropriate rehabilitation and follow-up. With increasing availability of smartphones and internet connectivity, video-based tele-consultation has enabled remote clinical follow-up in such settings. This prospective observational study evaluated the feasibility and clinical utility of a structured early tele-neurorehabilitation model using caregiver-assisted assessments and clinician-led video evaluation after acute stroke. Thirty-seven consecutive patients with ischemic or hemorrhagic stroke in the early post-stroke period were enrolled. Caregiver-assisted weekly assessments were conducted using a Google-based platform and included the Barthel Index, simplified Modified Rankin Scale, pain numeric rating scale, and PHQ-4, while scheduled video consultations with a neurologist and physiotherapist were used to verify functional status and perform clinician-led assessments. Feasibility outcomes included assessment completion rates, time required for assessments, and attrition, along with agreement between caregiver-assisted and clinician assessments. The tele-neurorehabilitation model demonstrated good feasibility with high completion rates and acceptable agreement, suggesting that structured tele-consultation is a feasible approach for early post-stroke neurorehabilitation follow-up in rural, resource-limited settings.

Feasibility of Brain Computer Interface Enabled Hand Exoskeleton Training for Upper Limb Motor Recovery in Stroke Patient: A Study Protocol

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Background: Stroke continues to be major cause of long-term motor disability in which upper limb impairment severely restricts functional independence and quality of life. Brain-computer interfaces (BCIs) enabled therapy emerged as novel neurorehabilitation technique that directly connects neural intent with aided movement, possibly improving neuroplasticity. However, evidence regarding its feasibility in standard stroke rehabilitation remains limited.

Objective: This protocol aims to evaluate the feasibility, safety, and acceptability of BCI-enabled hand exoskeleton training in individuals with stroke.

Methods: This will be a 2-arm randomized controlled study including both ischemic and haemorrhagic chronic stroke with Brunnstrom's hand stages 1–4. Participants will be randomly assigned to 2 intervention groups: BCI-enabled hand exoskeleton training and only robotic hand exoskeleton. Both groups will receive training, 3 times a week for 6 weeks (18 sessions). Acceptability of Intervention Measure, Intervention Appropriateness Measure and Feasibility of Intervention Measure will be used for examining the feasibility. Adverse effects, recruitment and retention will also be evaluated. Secondary outcome measures include Action Research Arm test, Fugl-Meyer upper extremity score and Grip strength. Patients will be assessed pre- and post-intervention to evaluate effect size estimation for future trials.

Expected Outcomes and conclusion: This study is expected to establish feasibility and acceptability of BCI-enabled exoskeleton training in stroke patients within clinical rehabilitation setting. Findings will direct protocol refinement, resource requirements, practical implementation and outcome selection for subsequent randomized controlled trial. This will contribute to development of advanced neurotechnology-based interventions aimed at enhancing post stroke motor recovery.

Effect of Yoga on Fear of Fall in Elderly Individuals

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Introduction: Age-related physiological and neuromuscular decline impairs balance and gait, increasing fall risk in older adults. Falls lead to injury, reduced mobility, fear of falling, and poorer quality of life. Balance-focused interventions are effective, and yoga offers a promising approach to improve stability through strength, flexibility, proprioception, and mental engagement.

Aim: To determine the effectiveness of a structured yoga program in improving balance and reducing fear of falling among elderly individuals.

Methodology: Observational study was conducted over 12 months among 43 elderly individuals aged 60 years and above. Participants were recruited using purposive sampling from rural and urban communities of Vadodara. Ambulatory individuals of both genders with corrected vision were included. Participants with MMSE score 24, GDS score 5, neuro musculoskeletal conditions affecting balance, or medical contraindications to yoga were excluded. Balance was assessed using the Berg Balance Scale and fear of falling using Modified Falls Efficacy Scale. A supervised-yoga program was administered for three days per week, for period of four weeks.

Results: Post-intervention analysis showed significant improvements in balance and fear of falling ($p < 0.0001$). Berg Balance Scale scores improved notably in dynamic balance components, including transfers, reaching, turning, reduced base of support, single-leg stance, and stepping tasks. Similarly, Modified Falls Efficacy Scale scores increased significantly post-intervention, across activities related to mobility and daily functioning, including reaching, household activities, using public transport, climbing steps and roads, indicating a reduction in fear of falling.

Conclusion: A short-term structured yoga program is effective in improving balance and reducing fear of falling among elderly.

Production and Feasibility Assessment of Action Observation Videos for Acute Stroke Survivors

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Introduction: Bed mobility is one of the earliest functional goals in acute stroke rehabilitation. Action Observation Therapy (AOT) is particularly useful when active movement is limited, as it enables task-specific motor learning through observation. Video-based AOT offers standardized, easily disseminated content feasible for use in hospital settings.

Aim: To develop, validate, and assess the feasibility of a component-based instructional video for the supine-to-sit transition as part of a bed mobility video catalogue for individuals with stroke.

Methodology: This methodological study was conducted in a tertiary care setup. Five bed mobility videos for acute stroke rehabilitation were developed following a literature review and expert input. Six stroke rehabilitation experts (10–15 years' experience) validated the videos across content, construct, timing, postural alignment, safety, audio clarity, video clarity, and cognition. Feasibility and acceptability were then assessed in 20 community-dwelling adults aged 40–60 years using the Assistive Technology Assessment Questionnaire.

Results: Expert ratings demonstrated strong validity for content, construct, and timing (each 83.33%) and very good video clarity (86.67%). Moderate scores for postural alignment, safety, cognition (66%), and audio quality (63.33%) led to modifications such as neutral head positioning, reduced visual distractions, clearer therapist hand placement, multiple camera angles, enclosed recording environments, and more detailed verbal instructions. In the general population, all ATAQ items scored near the maximum (mean = 2.0; median = 2), indicating excellent usability, clarity, and perceived learning value.

Conclusion: A validated video catalogue for bed mobility AOT was developed, suitable for future clinical application and research.

Usability Evaluation of Motorized Arm Support (MARS) for Robot-Assisted Upper-Limb Training

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Introduction: Stroke-related brain injury often causes arm weakness, limiting the ability to perform activities of daily living. High-intensity therapy can help restore these functions, and adaptive arm weight support is a key therapeutic approach. But existing passive devices lack engagement and adaptability, while robotic systems are costly for home use. The Motorized Arm Support (MARS) is a simple, compact solution designed for motivating, game-based in-clinic and home therapy. Usability feedback from clinicians, therapists, and stroke survivors is essential to refine the device for various arm training task.

Aim: To evaluate the usability of MARS with clinicians, and stroke survivors prescribed for upper limb rehabilitation.

Methodology: Part 1: The preliminary version of the robot was shown to the clinicians to get their feedback about the various features of MARS. Three training modes with MARS focus on movements of the shoulder and elbow.

Part 2: The design of MARS would be improved with the features deemed useful based on the clinician feedback from Part 1, and the usability of MARS was evaluated in two parts:

Part 2a – Usability Evaluation by Clinicians: The clinicians are invited to use MARS and rate the usability using the System usability scale (SUS).

Part 2b – Usability Evaluation by Stroke Survivors

Results: Usability evaluation of MARS by five clinicians yielded a mean SUS score of 82 (C1: 80, C2: 74, C3: 70, C4: 92, C5: 94). As SUS scores 70 indicate good usability, these results demonstrate that MARS has good usability for arm training.

Effect of Action Observation Training (AOT) Versus Conventional Therapy on Bed Mobility and Trunk Control in Patients with Acute Stroke: A Pilot Study

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Background: Early rehabilitation in acute stroke is essential for improving bed mobility, trunk control, which are strong predictors of functional independence. Action Observation Training (AOT), based on activation of mirror-neuron system, may enhance motor learning, early functional recovery; however, evidence in acute stroke remains limited. This pilot study compared the effects of AOT with Conventional Therapy (CT) on bed mobility and trunk control in acute stroke patients.

Methods: Twelve participants with first-episode acute stroke were randomly allocated into an AOT group (n=6) and CT group (n=6). Both groups received daily 45-minute sessions for 7 days, including 15 minutes of common preparatory exercises, 30 minutes of group-specific training. AOT involved observation and imitation of task-specific movement videos, CT consisted of traditional bed mobility and trunk exercises. Outcome measures Postural Assessment Scale for Stroke (PASS), Trunk Impairment Scale (TIS), STREAM-supine items, and ICF activity codes d410 and d415 were assessed pre- and post-intervention by a blinded evaluator. Data were analyzed using Wilcoxon signed-rank and Mann–Whitney U tests.

Results: Both groups demonstrated statistically significant within-group improvements in PASS, TIS, STREAM, and ICF activity scores ($p < 0.05$), indicating enhanced trunk control, basic mobility after 7 days. Between-group comparisons revealed no significant differences in change scores for any outcome ($p > 0.05$), ICF d415 showed a non-significant trend favoring AOT.

Conclusion: AOT and CT were both feasible and effective in improving early trunk control and bed mobility in acute stroke patients. No superiority of AOT was observed within short intervention period.

Effect of Yoga on Muscle Strength in Elderly Individuals with Sarcopenia

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Introduction: Sarcopenia is an age-related disorder that causes a gradual loss of functional ability and muscle strength, which makes senior citizens less independent. Though its short-term effects on muscle strength and functional results in people with sarcopenia are still unclear, yoga is increasingly suggested as a low-impact exercise for the aged.

Aims: To evaluate the effect of yoga on lower limb strength, and hand grip strength in elderly individuals with sarcopenia.

Methodology: 43 elderly individuals with sarcopenia who were 60 years of age or older participated in a pre-post interventional trial. For four weeks, each participant received a supervised yoga intervention. The SARC-F questionnaire, a digital dynamometer for hand grip strength, and 30-second Chair Stand Test for lower limb strength were used as outcome measures. Values pre and post the intervention were statistically evaluated.

Results: Forty-three elderly individuals (mean age: 67.14 ± 6.74 years; 53.49% males, 46.51% females) were included. After the yoga intervention, lower limb muscle strength showed statistically significant improvement, with chair stand repetitions increasing from 8.47 ± 1.89 to 10.32 ± 2.04 ($p < 0.05$). SARC-F scores demonstrated a reduction, and hand grip strength showed a modest increase; however, these changes were statistically significant ($p > 0.05$). Improvements were comparable between male and female participants.

Conclusion: A four-week yoga intervention significantly enhanced lower limb strength in elderly individuals with sarcopenia, while its effects on hand grip strength and self-reported sarcopenia severity were limited. Yoga may be particularly beneficial for improving lower limb function over short durations.

Non-Immersive Virtual Reality To Improve Distal Hand function and Independence in Tetraplegia

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Background: Impairment of distal upper-limb function is a common consequence of tetraplegia, markedly restricting functional independence. VR Rehabilitation has demonstrated potential to enhance motor recovery through task-oriented training and experience-dependent neuroplasticity. However, most available VR systems are either expensive or rely on complex algorithms, limiting their accessibility and suitability. To address this gap, the present study evaluates the effectiveness of indigenously developed, cost efficient VR-based rehabilitation device in improving hand function among individuals with tetraplegia.

Aim: To evaluate the effectiveness of a non-immersive VR-based intervention for distal upper extremity motor recovery and functional outcomes in individuals with tetraplegia.

Methodology: The pilot study (CTRI Reg. No: CTRI/2026/01/101428) enrolled 5 individuals with tetraplegia (neurological level C4–C6; AIS grades: A–B). Cognitive function was assessed pre-intervention using the Montreal Cognitive Assessment (MOCA). Participants underwent a structured, non-immersive VR training. Distal motor function was evaluated using the Box and Block Test, Graded Redefined Assessment of Strength, Sensibility, and Prehension (GRASSP), and Spinal Cord Independence Measure version III.

Results: All five participants completed the intervention and demonstrated consistent improvements across outcomes. Box and Block Test scores improved by 81.7%, GRASSP scores by 32.8%, and SCIM-III scores by 22.0%, indicating enhanced distal upper-limb function and functional independence following training.

Conclusion: Improvements were observed in distal upper extremity, including strength, prehension and functional independence. High usability and engagement suggest that this indigenous, low-cost VR-based approach is a

promising adjunct to rehabilitation and merits further evaluation in larger controlled trials.

Keywords: Tetraplegia, non-immersive VR, Spinal cord injury

Reviving the Dormant Face: sEMG Biofeedback Facilitates Functional Recovery in 10-Year Chronic Paralysis Post-Facial Schwannoma Resection

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Introduction: Facial nerve dysfunction is one of the most common post-operative complications after resection of Vestibular Schwannoma. Delay in its functional recovery can present with neuromuscular deficits like poor voluntary control, facial asymmetry, synkinesis and psychosocial distress. While early rehabilitation is standard, efficacy of neuromuscular retraining in long-term cases (>10 years) using biofeedback remains underreported, with many patients considered to have reached permanent plateau.

Aims: This study evaluates efficacy of Surface Electromyography (sEMG) biofeedback in restoring voluntary neuromuscular control, improving symmetry, in a patient with 10-year chronic facial palsy with failed previous conventional therapies.

Methodology: A female patient presenting 10 years post-facial schwannoma resection with House-Brackmann Grade V palsy underwent neuromuscular retraining using Digital sEMG biofeedback therapy. This protocol focused on "selective training" of muscles utilizing audio-visual feedback to activate zygomaticus major, orbicularis oris, orbicularis oculi and frontalis muscles. Total 42 sessions were provided at 2 sessions/ week, within 7 months.

Results: There was significant change in sEMG amplitudes, indicating revival of muscle activity and voluntary control. Voluntary smile excursion and facial symmetry at rest were restored. Improvements in House Brackmann Grades from V to III confirmed that targeted motor learning is possible even after a decade.

Conclusion: Digital sEMG biofeedback therapy facilitates neuroplasticity to treat chronic facial paralysis, proving superior to passive modalities even 10 years post-injury. This case challenges the traditional "window of recovery," suggesting that long-stsanding paralysis does not preclude functional restoration when precise, active neuromuscular retraining is employed, however, the right choice of patient is critical.

Beyond Pediatrics: A Scoping Review of Exergaming and Virtual Reality for Balance and Physical Activity in Adults with Down Syndrome

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While rehab for kids with Down Syndrome (DS) gets plenty of attention, adults with DS are often overlooked. They deal with early aging, high obesity, and shaky balance, and traditional therapy flops due to boredom and access issues. Enter tech like exergaming (think Nintendo Ring Fit) and immersive virtual reality (IVR)—fun ways to blend exercise with sensory thrills. This review checks how feasible, sticky, and effective these gamified tools are for adult DS folks.

Methods: We did a scoping review on PubMed, Web of Science, and Google Scholar for studies from 2021–2026. We focused on adults over 18 with DS using active video games or VR headsets for physical rehab. Key measures: adherence, usability (System Usability Scale), and motor skills [Berg Balance Scale (BBS), Timed Up and Go (TUG)].

Results: We found 8–10 solid studies with about 240 participants total. Fresh 2025–2026 trials show exergaming with sky-high adherence (90–96%), blowing past regular home workouts. Balance gains were huge (meta-analysis SMD = 2.72), with BBS scores jumping up to 15 points. The 2026 InDown Pilot nailed usability (SUS >92/100), proved VR safe (cybersickness <2.1/48), and logged 123 minutes of moderate activity weekly at home.

Conclusion: Exergaming and VR are game-changers—feasible, safe, and super engaging for adults with DS. They tackle balance woes and inactivity while keeping motivation high. In low-resource spots, off-the-shelf consoles beat pricey robots. Next up: standard "dosage" guidelines for heart health and motor perks in aging DS adults.

Efficacy of End-Effector Robotic Training with Conventional Rehabilitation for Improving Balance and Gait in a Rare CIDP–Guillain-Barré Syndrome Overlap: A Case Report

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Introduction: Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is a rare autoimmune disorder, and its overlap with Guillain-Barré Syndrome (GBS) often results in delayed and incomplete functional recovery. Evidence regarding advanced rehabilitation strategies in such overlaps is limited. This case report explores the efficacy of end-effector robotic training combined with conventional rehabilitation on balance, gait, and functional outcomes.

Case Description: A 21-year-old male with CIDP–GBS overlap, post-immunotherapy, presented with severe limb weakness and inability to stand or walk independently. The patient underwent end-effector robotic balance and gait training in addition to conventional rehabilitation for four weeks. Outcome measures included the Berg Balance Scale (BBS), Centre of Pressure (COP) parameters on the Tymo® Balance Platform, gait assessment using the 10-Meter Walk Test (10MWT) on the Pablo® Lower Extremity System, Functional Ambulation Category (FAC), Timed Up and Go (TUG) test, and the 6-Minute Walk Test (6MWT).

Results: Post-intervention, BBS improved from 9 to 28. COP analysis demonstrated reductions in mean trajectory (76.5 cm to 33 cm) and sway area (0.5 cm^2 to 0.1 cm^2). Gait parameters improved with increased velocity (0.5 km/h to 1.1 km/h), cadence (40.6 to 51.5 steps/min), and stride length (40 cm to 73 cm). FAC improved from 1 to 3, TUG from 1 min 53 s to 49 s, and 6MWT distance from 260 m to 375 m.

Conclusion: High-intensity, task-specific end-effector robotic training combined with conventional rehabilitation facilitated accelerated functional recovery in this rare CIDP–GBS overlap. Further studies are required to establish its efficacy.

The Effectiveness of Motor Imagery Training on Lower Extremity function and gait parameters in Subjects with Stroke: A Randomized Controlled Trial

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Introduction: Stroke is the second leading cause of mortality and disability among millions resulting in 88% of patients to experience residual dysfunction in lower limb. These dysfunctions are often related to timing, balance, co-ordination and loss of strength in affected limbs.

Motor imagery training [MIT], a new form of rehabilitation has gained interest for being a low-cost, non-invasive technique allowing safe repetitive cognitive rehearsal without physical strain.

Aim: To evaluate the effectiveness of motor imagery training on lower extremity function and gait parameters in stroke subjects.

Methodology: Both groups received 6 standardized physiotherapy sessions of 45 minutes each. The experimental group received 15-20 minutes of MIT over 6 consecutive days.

Outcome measures were recorded pre-post intervention with Fugl-Meyer Assessment Lower Extremity (FMA-LE) and Berg Balance Scale (BBS) as primary measures and cadence, gait velocity and stride length as secondary.

Baseline comparisons between groups were assessed using Chi-square test for categorical variables and Wilcoxon rank-sum test for continuous variables. Within group pre-post changes were analysed using t-tests and between group changes were evaluated using Mann Whitney U test.

Results: Both groups showed statistically significant pre-post improvements in FMA- LE and BBS scores ($p < 0.001$). The interventional group showed a higher improvement in FMA-LE scores(mean =11.94 vs 7.67; p=0.003) and BBS scores (mean =16.61 vs 9.59; $p = 0.007$). Both groups also showed significant improvements in cadence, stride length and gait velocity($p < 0.001$).

Conclusion: Motor imagery training with conventional therapy may improve balance and gait of stroke patients significantly better than conventional therapy alone.

Influence of Bilateral Asymmetric Task Training on Functional Recovery in Individuals with Chronic Stroke: A Randomized Clinical Trial

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Introduction: Motor recovery following stroke is often limited by impaired interhemispheric coordination and reduced functional use of the affected upper limb. Bilateral training approaches have shown promise; however, symmetric bilateral movements may not adequately promote independent limb control. Bilateral asymmetric task training (BATT), which requires each limb to perform different tasks simultaneously, may better stimulate motor planning, coordination, and use-dependent neuroplasticity, leading to improved functional recovery.

Aims: To evaluate the effect of bilateral asymmetric task training on upper limb functional recovery in individuals with chronic stroke.

Methodology: A randomized clinical trial was conducted with 30 individuals with chronic stroke (6 months post-stroke). Participants were randomly allocated into two groups: Group A (n = 15) received bilateral asymmetric task training combined with conventional physiotherapy, while Group B (n = 15) received bilateral symmetric task training with conventional physiotherapy. Training was provided for 6 weeks, 5 sessions per week. Outcome measures included the Wolf Motor Function Test (WMFT) and the Motor Activity Log-Amount of Use (MAL-AOU), assessed at baseline and post-intervention. Data were analysed using paired and independent t-tests with significance set at $p < 0.05$.

Results: Group A demonstrated significantly greater improvements compared to Group B in WMFT scores ($p = 0.002$) and MAL-AOU scores ($p = 0.001$), indicating superior motor performance and increased functional use of the affected upper limb.

Conclusion: Bilateral asymmetric task training is more effective than bilateral symmetric training in improving upper limb functional recovery in individuals with chronic stroke and represents a feasible, low-cost neurorehabilitation strategy.

Scarcity, Structure, and Synapse: Defining "Resource-Dependent Neuroplasticity" in Low-Income Addiction Care

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High attrition rates in Indian addiction rehabilitation programs present a persistent public health failure, often attributed to individual non-compliance rather than systemic incompatibility. This paper challenges that view, arguing that the prevailing biomedical models ignore the cognitive load of poverty, rendering standard treatments structurally ineffective for marginalized populations.

We propose a theoretical framework of "Bandwidth Collapse," positing that the convergence of acute scarcity and substance dependence creates a cognitive bottleneck. In this state, the executive functions required for recovery are cannibalized by the immediate metabolic and decision-making demands of survival. We operationalize this through two constructs:

1. Recovery Bandwidth: The residual cognitive capacity available for therapeutic engagement after survival needs are met.
2. Resource-Dependent Neuroplasticity: The postulate that the brain's ability to repair neural pathways is rate-limited by environmental and economic deprivation.

Synthesizing neuroeconomics with a structural analysis of Indian caste and labor dynamics, we critique current "high-friction" interventions that demand excessive cognitive reserves from depleted patients. In their place, we outline a paradigm of "Resource-Aware Rehabilitation." This model advocates for "structural competency" in clinical design, shifting the burden of executive function from the individual to the system through cognitively ergonomic, low-barrier support.

Approach to Neuro-Rehabilitation in a Minimally Conscious State (MCS) of Pontine Haemorrhage: A Case Study

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Pontine Haemorrhage is a form of intracerebral haemorrhage characterised by bleeding within the pons, a critical area of the brain stem, responsible for various autonomic functions including breathing and heart rate regulation. It often results from chronic hypertension and carries a poor prognosis. Pontine haemorrhage comprises approximately 10% of intracerebral haemorrhages with a prevalence of 7.5–10% of haemorrhagic strokes. The consequences of pontine haemorrhage can be severe and varied, often leading to significant neurological deficits and poor outcomes. Rehabilitation is a critical component of recovery from pontine stroke. It aims to restore lost functions and improve the quality of life of individuals affected by this condition. The aim of this study is to document the treatment approaches that were adopted in a holistic neuro-rehabilitation facility for a 53 year old female patient who presented with a minimally conscious state (MCS) after suffering a pontine haemorrhage. The treatment approaches utilised focused on increasing verticality time through tilt board standing, ambulation with long splints, use of electro modalities such as Russian currents, movement re-education for training available voluntary control. Apart from this a cognitive training with a robotic based interactive screening device, called MYRO was also used in conjunction with tilt standing to improve patient awareness and focus. Over a period of consistent rehabilitation for nearly 2 years, the patient demonstrated significant improvements in her scores on the Coma Recovery Scale – Revised (CRS) which a gold standard, neuro-behavioural assessment measure for use in patients with Disorders of consciousness (DOC).

Telerehabilitation Safety Guidelines Across Diverse Patient Populations: A Scoping Review and Quality Appraisal Using the Agree II Instrument

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Introduction: Telerehabilitation has demonstrated feasibility, effectiveness, and safety across rehabilitation populations. However, its utilization remains inconsistent, partly due to concerns about patient safety and the absence of dedicated guidelines addressing risks unique to telerehabilitation. Evaluating existing guideline quality is necessary to support the development of comprehensive, evidence based telerehabilitation safety standards.

Aim: To systematically identify telerehabilitation related guidelines across rehabilitation settings and appraise their quality using the AGREE II instrument to inform national telerehabilitation safety guideline development.

Methods: A scoping review was conducted in June 2025 across multiple databases and grey literature. Eligible documents included clinical practice guidelines, consensus statements, and position papers published within the past ten years that provided evidence informed recommendations on telerehabilitation or virtual care with safety considerations. Guidelines underwent multi stage screening followed by independent quality appraisal by four trained reviewers using AGREE II. Standardized domain scores and overall quality ratings were calculated, and safety related recommendations were extracted.

Results: From 5,041 records, 26 guidelines were included. Most originated from high income countries and national organizations. Four AGREE II domains—scope and purpose, stakeholder involvement, clarity of presentation,

and editorial independence—achieved high scores (60%). Rigor of development and applicability scored lower, with rigor showing the greatest variability. Overall guideline quality was moderate (mean 4.9). Ultimately, 22 guidelines contributed 239 telerehabilitation safety recommendations for synthesis.

Conclusion: Existing telerehabilitation related guidelines are generally of moderate quality, with gaps in methodological rigor and applicability. These findings provide a critical foundation for developing robust, evidence informed Canadian Telerehabilitation Safety Guidelines.

Use of Tele-Practice Among Speech Language Pathologists (Slps) for Pediatric Communication Disorders in India: An E-Survey

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Introduction: The tele practice services are now being provided all over the country to all age groups. It is observed that more of the pediatric population is enrolled in tele therapy services as greater number of children are seen to have speech and language problems. Due to increasing inclination of SLPs towards this mode of service delivery, it is essential to know the views of SLPs with respect to use of tele-practice for Pediatric Communication Disorders especially in Indian context.

The aim of this study was to conduct a survey amongst Indian Speech Language Pathologists (SLPs) regarding the use of teletherapy services in Pediatric communication disorder cases.

The Objectives Were:

1. To construct a questionnaire which can be used as a tool to investigate the use of tele-practice among SLPs for evaluation and intervention of pediatric communication disorders.
2. To check the content validity of the questionnaire constructed.
3. To analyze the use of tele-practice services provided by SLPs to pediatric population.

Methodology comprised of a web-based descriptive cross-sectional survey carried out regarding the use of tele-practice by Speech Language Pathologists, for pediatric communication disorders and their perspectives towards tele-practice.

The Questionnaire involved areas such as clinical services, connectivity/resources, patient selection, parent/caregiver's involvement, service delivery, feasibility, teleservice: assessment & child's response, SLP's views.

Results revealed that although only 8.4% participants among 119 participants were formally trained for tele-practice, it is a popular mode of service delivery for the SLPs due to its accessibility, cost-effectiveness, and ease of use.

Saving Carbon Emissions Via Tele-Rehabilitation – The Green Solution

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Introduction: Tele-rehabilitation is the delivery of rehabilitation services using information and communication technologies (ICT) to clients. It is the go-to solution to increase access in rehabilitation services, while saving travelling time, costs and carbon emissions.

Objectives: To describe the estimated carbon emission savings and travelling cost of patients receiving tele-rehabilitation in a rural hospital in Malaysia.

Methods: An audit was performed on all patients who received tele-rehabilitation at the Rehabilitation Medicine clinic at Hospital Tuanku Ampuan Najihah, Kuala Pilah, Negeri Sembilan, Malaysia from June 2021 to December 2021. Distance from the patients' home address to the hospital and travelling time were calculated using Google Maps. Carbon dioxide emission was calculated using the formula 120.4g/km (return trip). The travelling cost was set at RM 0.50 per km.

Results: A total of 110 out of 316 (34.8%) patients received tele-rehabilitation services during the audit period. The estimated total carbon emission savings were 865,989 g (median 7,994.5 g; min 228.8 g, max 21,310.8 g). The estimated total travelling cost savings were RM 3,596.30 (median RM 33.20; min RM 0.95, max RM 88.50). The estimated travelling time saved in total was 136 hours and six minutes (median 1 hour 12 mins; min 6 mins, max 3 hours 10 mins).

Conclusion: Tele-rehabilitation may prove to be a green solution to reduce carbon emissions, travelling costs and time.

Correlation of Balance Test on TYMO Force Plate with MRI Findings Of L4–L5 and L5–S1 Nerve Root Involvement in Patients with Prolapsed Intervertebral Disc (PIVD)

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Introduction: PIVD is a common cause of lumbar radiculopathy, particularly affecting the L4–L5 and L5–S1 nerve roots. Through the MRI the protrusion of the intervertebral disc will be visible. Depending on the affected area the patient will be anteropulsive or retropulsive on the TYMO balance assessment. Establishing a correlation between findings of balance test on TYMO Force Plate and MRI findings will provide a more comprehensive understanding of functional impairment in PIVD patients.

Aims: To evaluate the correlation between TYMO Force Plate balance and motor control parameters with MRI-confirmed L4–L5 and L5–S1 nerve root affection in PIVD patients.

Methodology: Study Design is Observational, Assessor blinding.Setting in Atharv Ability Neuro rehabilitation center Participants with an Inclusion of Patients diagnosed with lumbar PIVD, confirmed by MRI And exclusion of Prior spinal surgery, neurological disorders unrelated to PIVD, severe musculoskeletal deformities. Sample Size is 82 patients. Data Collection Patients who present with Low back pain and MRI Assessment of Identification of nerve root affection at L4–L5 or L5–S1 and TYMO Force Plate balance Assessment.

Results: A significant positive association was observed between Participants with L4–L5 anteropulsive and L5–S1 retropulsive dics finding predominantly demonstrated positive Tymo force plate results, indicating a relationship between Structural disc displacement and functional lunbar dysfuntion. L4–L5 anteropulsive disc with balance test on force plate with 83.7% and L5–S1 retropulsive disc with 88.4% p value < 0.05.

Conclusion: This study concludes that there was a positive correlation between the tymo and the MRI results in PIVDPatients

EARLY-COGN^3: A Digital At-Home Cognitive Rehabilitation Program for Chronic Neurological Diseases

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Background: Promoting healthy cognitive functioning is fundamental to prevent or delay the cognitive decline in neurodegenerative disorders. To face the increasing need of rehabilitation, telehealth solutions can have a disruptive role allowing the promotion of autonomous, home-based interventions.

Aims: 1-to test the efficacy of a digital health at-home intervention (tele@cognitive) as compared to unstructured cognitive at-home rehabilitation (Usual Care-UC) in a cohort of patients with Chronic Neurological Diseases (CNDs); 2-to investigate its effects on biomolecular and neurophysiological markers; 3-to analyze potential cognitive, neurobiological, and neurophysiological predictors of response to the tele@cognitive treatment.

Methods: Aim 1: a single-blind, pilot RCT (NCT06657274) study, will compare the short and long-term efficacy of tele@cognitive to UC in a cohort of 60 people with Mild Cognitive Impairment, Subjective Cognitive Complaints, or Parkinson's Disease. All participants will undergo a clinical, functional, neurocognitive, and quality of life assessment. **Aims 2 and 3:** neurophysiological responses to TMS over the motor cortex; and biomarkers of neurodegeneration, neuroinflammation, synaptic function, and neuronal communication will be collected.

Results: RCT is ongoing and is expected to show that tele@cognitive intervention leads to greater improvements in global cognitive functioning and specific cognitive domains compared to UC, both at post-intervention and follow-up assessments. Additionally, tele@cognitive is hypothesized to induce measurable changes in neurophysiological responses and biomolecular markers related to neurodegeneration, neuroinflammation, synaptic function, and neuronal communication.

Conclusion: Expected results would be important to promote a paradigm shift in the primary and secondary prevention of cognitive decline in CNDs taking advantage of digital health solutions.

A Systematic Review Investigating the Effectiveness of Virtual Reality Treadmill Training Versus Traditional Treadmill Training for Improving Gait in Adult Stroke Patients

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Background: Stroke is a global burdensome neurological-condition causing sensorimotor impairments and long-term disabilities. Many stroke survivors experience gait-dysfunctions that reduce quality-of-life. Approach like Treadmill Training [TT] for gait-training is recommended to yield better outcomes. Recently, Virtual Reality [VR] is emerging as a promising approach in stroke-rehabilitation. Virtual Reality Treadmill Training [VRTT] is thus a combination of VR and TT, a novel approach for gait-rehabilitation. However, evidence and clinical guidelines for its use in stroke remain limited.

Aim: This review's aim was to examine whether the combination of VR and TT is more beneficial than Traditional Treadmill Training [TTT] for improving gait in adult stroke patients. To achieve that, the effectiveness of VRTT was compared to TTT on gait outcomes in adult stroke patients.

Methods: A systematic search strategy acquired 7 Randomised Controlled Trials [RCTs] that were relevant for inclusion. These studies were then critically appraised by two independent reviewers and six RCTs were forwarded for data extraction and synthesis.

Results: Data was extracted using the revised Joanna Briggs Institute's extraction tool for RCTs. Due to substantial methodological heterogeneity, a narrative synthesis was conducted. Results revealed that combining VR with TT produced greater improvements on gait parameters than TTT. Although outcome-measures varied across studies, most reported significant gains with VRTT.

Conclusion: Evidence suggests VRTT is more effective than TTT for improving gait after stroke, and combining VR with TT may be beneficial. However, findings are limited by methodological heterogeneity, so cautious application is needed and further high-quality, large-scale trials are required.

Design and Validation of a Compact, Portable Sensor-Based Toolkit for Quantitative Assessment of Upper Limb Function

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Introduction: Upper extremity function is essential for daily activities, and its impairment can significantly limit independence and participation. Clinical assessments are vital for tracking recovery and evaluating therapeutic outcomes, yet many current measures are qualitative, time-intensive, and limited in capturing detailed movement characteristics. While quantitative metrics such as grip strength and movement smoothness correlate well with scales like FMA and ARAT, portable and objective tools for clinical use remain lacking.

Aim: To develop and validate a portable toolkit combining inertial measurement units (IMUs) and a dynamometer for quantifying upper limb movement smoothness.

Methods: Three IMUs will be placed on the forearm, upper arm, and trunk. Participants will perform two table-top tasks on cue: (1) reach and return, and (2) reach, grasp, lift, and place at a 45° position relative to the starting point. Data will be transmitted wirelessly via Bluetooth to a custom PC-based software interface for analysis. Simultaneously, data from an optical motion capture system will be recorded to validate the log dimensionless jerk values computed from the IMU signals.

Results: A portable sensor-based toolkit with four wireless devices—three IMU units and one dynamometer—was developed. Each device integrates a Seeeduino XIAO BLE Sense, battery, and MPU6050. The dynamometer includes two load cells and an IMU for force and orientation tracking. A custom software enables real-time, synchronized data acquisition from all devices.

Conclusion: The developed toolkit demonstrates feasibility for quantitative assessment of upper limb movement smoothness using portable, low-cost sensors.

Multi-Perspective Observational Study on Technology Requirements for Home-based Upper-Limb Tabletop Functional Task Training with Minimal Supervision

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Introduction: Upper-limb (UL) impairment following stroke significantly limits independence in activities of daily living (ADLs). Although tabletop functional task-oriented training (FTOT) is a cornerstone of neurorehabilitation, both conventional therapist-led and technology-supported FTOT face limitations in consistency, supervision, progression and continuity across settings.

Objective: To characterise current clinical practices in UL tabletop FTOT and to identify stroke survivor-caregiver dyads' needs, constraints, and support requirements across clinical and home contexts to inform user-centred technology development.

Methods: A multi-phase mixed-methods design was employed. Phase-A included a quantitative survey of rehabilitation therapists to characterise UL tabletop training delivery (e.g., task selection, dose, progression). Survey findings informed the development of purposive sampling and an interview guide for a linked qualitative strand that will examine task orchestration, adaptation, and clinical decision-making in depth. Phase-B comprised semi-structured interviews with dyads to explore FTOT experiences across clinical and non-clinical contexts. Quantitative data will be analysed descriptively, and qualitative data will be analysed using general inductive approach. Findings will be integrated using joint displays. Institutional Review Board approval was obtained. Patient and public involvement (PPI) activities and a pilot dyadic interview were completed to refine study materials and procedures.

Results: Emerging findings are expected to integrate therapist and dyad perspectives, highlighting practice variability, barriers, and safety considerations relevant to tabletop FTOT with implications for the design of future technology development and evaluation.

Conclusion: The resulting design implications support clinically feasible, context-sensitive, and user-centred approaches to UL FTOT, supporting continuity of rehabilitation across settings.

Unveiling Caregiver Challenges in India: A Comparison of Caregiver Burden in Subacute and Chronic Stages of Spinal Cord Injury Recovery

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Introduction: Spinal cord injury (SCI) places significant demands on both patients and caregivers. In India, where formal support is limited, this burden falls largely on families. The subacute and chronic stages of SCI recovery present distinct caregiving challenges, yet little research has compared burden across these phases in the Indian context. This study addresses this gap by identifying phase-specific challenges to inform targeted caregiver interventions.

Aim: To determine the differences in caregiver burden between the subacute and chronic stages of spinal cord injury, considering physical, emotional, social, time and economical aspects using the CBS-IP.

Methods: Cross-sectional study conducted over one year. 40 primary caregivers of PWSCI (20 subacute, 20 chronic) were assessed using the Caregiver Burden Scale-Indian Population (CBS-IP) through in-person interviews. Patient functional status was evaluated using the American Spinal Injury Association (ASIA) Impairment Scale and Spinal Cord Independence Measure (SCIM). Sociodemographic data were collected via structured proforma.

Results: Chi-square test was used to compare burden distribution wherein 90% of caregivers experienced moderate-to-severe burden, with no significant demographic associations (all $p > 0.05$). All domains correlated significantly with overall burden ($p < 0.01$), with economic (75%, $F = 10.85$, $p < 0.001$) and psychological domains ($F = 11.46$, $p < 0.001$) most affected. 90% lacked social support. Subacute caregivers showed significantly higher time burden than chronic caregivers (70.71% vs. 55.75%, $p = 0.017$).

Conclusion: Caregiver burden in SCI is universal, driven by care demands rather than demographics. Critical lack

of social support (90%) combined with severe economic and psychological burden necessitates urgent structured interventions including financial assistance, psychological counselling, and enhanced early-phase support.

"Digital Health Equity—Importance and Implementation Strategy"

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Introduction: Digital health equity has emerged as a central objective in healthcare innovation, emphasizing that digital health technologies (DHTs) must be accessible and beneficial for all individuals, regardless of socioeconomic status, geography, age, or digital literacy. Persistent disparities in access to technology, connectivity, and inclusive design threaten to widen existing health inequities rather than reduce them.

Aim and Objectives: This narrative review aims to synthesize current evidence on the importance of digital health equity and identify effective strategies for its implementation. The review highlights barriers to equitable digital healthcare and actionable approaches to mitigate these gaps.

Methods: A narrative literature synthesis was conducted, drawing on peer-reviewed literature and framework analyses that focus on digital health equity conceptualization, determinants, and implementation strategies. Key themes related to multilevel determinants, inclusive design, infrastructure, and educational support were collated and analysed.

Results: Digital health equity is framed as an equitable opportunity to access, engage with, and benefit from DHTs. Multilevel determinants, including individual skills, technology access, organizational practices, and policy contexts, shape equity outcomes. Strategies to advance equity include (1) inclusive and user-centered technology design; (2) supportive infrastructure; (3) targeted digital literacy and training programmes; and (4) participatory and co-design approaches involving underserved communities.

Conclusion: To realize the promise of digital health for all, equity must be embedded in planning, implementation, and evaluation. Multisector partnerships, culturally tailored solutions, and robust governance frameworks are essential to ensure digital health interventions enhance access and do not perpetuate disparities.

Oropharyngeal Dysphagia in Self-Inflicted Neck Trauma in Adult – SLP Perspective on Clinical Management

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Introduction: Self-inflicted neck injuries damages aerodigestive structures, causing severe oropharyngeal dysphagia. In this case, pharyngeal plexus injury impaired motor innervation of the pharyngeal constrictors and soft palate, affecting bolus form and airway management. Commonly compromised structures include the pharynx, larynx, hyo-laryngeal complex, upper esophagus, cranial nerves IX–XII, strap muscles, and trachea.

Aim: Improve strength and coordination of the suprahyoid musculature and facilitate hyolaryngeal elevation and pharyngeal phase efficiency.

Reduce aspiration risk and improve airway protection during swallowing initiation.

Methodology: Comprehensive bedside swallow evaluation was conducted postoperatively by a Speech-Language Pathologist, including medical–surgical review, tracheostomy and nutrition status, cranial nerve (IX, X, XII) examination on oral motor assessment, saliva management, and observation of clinical signs of dysphagia, as instrumental assessment was not feasible.

Results and Discussions: Suprahyoid strengthening and effortful swallow exercises were tolerated; however functional oral intake didn't improve. Due to the ongoing risk of aspiration, the patient remained dependent on Ryle's tube at present.

Overall pharyngeal weakness secondary to pharyngeal plexus involvement were consistent, with minimal short-term responsiveness to rehabilitative intervention during the observed phase.

Conclusion: This outcomes were limited due to short-term responsiveness as severe neurogenic pharyngeal dysphagia associated with pharyngeal plexus injury.

The findings highlights the role of the Speech-Language Pathologist in early identification, risk management, caregiver counseling, and prevention of secondary complications, even in the absence of functional recovery. Multidisciplinary collaboration is CRUCIAL for optimizing patient psychological well-being, and long-term rehabilitation planning.

Influence of Body Weight Support (BWS) Level on Trunk Rotator Strength and Gait Symmetry During LEXO-Assisted Gait Training in Individuals with Stroke: A Randomized Controlled Cross-over Study

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Introduction: Body-Weight–Supported (BWS) robotic gait training using LEXO is widely used in stroke rehabilitation to facilitate safe and repetitive walking practice. While varying levels BWS influence lower-limb loading, their immediate effects on trunk neuromuscular performance and gait symmetry have not been clearly established.

Aim: To examine the immediate effects of high versus low BWS during LEXO-assisted gait training on trunk rotator strength and gait symmetry in individuals with stroke.

Methods: This study is being conducted as a randomized controlled cross-over immediate-effect trial on twenty-four individuals with stroke participating in a single-session LEXO-assisted gait training under two experimental conditions: high body weight support (30%) and low body weight support (10%). The order of the conditions is randomized for each participant. Walking speed and guidance force is kept constant across both conditions, with a standardized rest period provided to minimize fatigue. The primary outcome is isometric strength of trunk rotator muscles, assessed immediately after each condition using the Tergumed® system (Proxomed, Germany). Secondary outcomes include gait symmetry parameters measured using the PABLO gait assessment system and LEXO-derived spatiotemporal gait data. Data normality will be assessed using the Shapiro–Wilk test. For normally distributed data, within-subject comparisons will be performed using paired t-tests, with the level of significance set at $p < 0.05$

Results: Results will be analyzed following completion of data collection.

Conclusion: This study will help in guiding clinicians in optimising BWS parameters during robotic gait training and clarify effect of different BWS levels on trunk rotator strength and gait symmetry.

A Comparative ECG Analysis of Unilateral and Bilateral High-Frequency taVNS in Healthy Adults: Ancillary Study

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Introduction: Transcutaneous auricular vagus nerve stimulation (taVNS) is an emerging neuromodulation tool in neurorehabilitation. Owing to the extensive distribution of vagus nerve, including its cardiac innervation, its cardiovascular effects remain of interest. Low-frequency taVNS has demonstrated its safety, but the impact of high-frequency stimulation is largely unexplored, highlighting the need for further investigation. Considering the variability in cardiac responses among neurological patients,a thorough understanding of its safety is essential for its potential use in clinical settings. AIM:To evaluate the safety of unilateral and bilateral high frequency taVNS on healthy adults using electrocardiogram (ECG).

Participants:

- Inclusion Criteria:52 healthy adults,aged 18-45 years
- Exclusion Criteria:History of neurological,psychiatric,or cardiac disorders, auricular soft-tissue injury,ear infection.

Methods: The study used a prospective crossover design in which 26 participants completed both unilateral and bilateral stimulation at frequency-100 Hz, pulse width-200ms for 30 minutes with continuous ECG monitoring.

Results: Data was analyzed using a repeated-measures ANOVA with Stimulation Type (unilateral, bilateral) and Time (pre-, during-, and post-stimulation) as within-subject factors to assess effects on heart rate, PR interval, and QTc interval. No statistically significant effects were observed for heart rate ($p > 0.954$) or PR interval ($p > 0.95$). In contrast, a statistically significant change in QTc interval was observed during bilateral stimulation ($p < 0.046$), however the QTc values remained within established normal limits.

Conclusion: High-frequency taVNS showed no detectable ECG changes in healthy individuals, indicating a low likelihood of adverse cardiac effects under the tested parameters. These results support its safety and justify further study in clinical populations.

Effect of Perturbation Based Balance Training on Balance and Gait in Older Adults

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Background: Age-related decline in balance, gait, and muscle strength increases the risk of falls, particularly during sudden postural disturbances. Conventional balance training mainly focuses on predictable movements and may not adequately improve reactive balance. Perturbation-based balance training (PBT) has shown to enhance postural stability; however, evidence using unstable surfaces remains limited.

Objective: To evaluate the effect of perturbation-based balance training using unstable surfaces on balance, gait, fear of falling, and lower-limb strength in older adults.

Methods: Forty community-dwelling adults aged > 60 years were either given conventional or perturbation-based balance training. Both groups received 45–50-minute sessions, three times per week for six weeks. The PBT group trained on unstable surfaces (BOSU ball, balance cushions, and foam mattress) along with external manual perturbations. Balance and Gait were assessed using Brief-BESTest, fear of fall using the MFES, and lower-limb strength using 30-Second Chair Stand Test before and after the intervention.

Results: Both groups showed significant improvements in gait, strength, fear of fall, and overall balance ($p<0.01$). The Brief-BESTest total score showed larger effect size in the PBT group than the control, with greater improvements in reactive balance components in PBT.

Conclusion: While both interventions were effective, adding PBT using unstable surfaces produced greater improvements in reactive and dynamic balance, indicating that PBT is a valuable adjunct to conventional therapy in older adults.

Design and Clinician-Based Evaluation of ATOBOT, an Underactuated 2-DOF Ankle–Toe Rehabilitation Robot for Post-Stroke Foot Function Training

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Introduction: 80% of stroke survivors develop locomotor dysfunction, most notably foot drop, which leads to toe drag, postural instability, and increased fall risk. Most existing ankle rehabilitation robots focus solely on the ankle joint and do not address toe impairments, despite their critical role in balance control, weight transfer, and gait propulsion. This integration aims to fill a key clinical gap by enabling combined ankle and toe training.

Aim: To evaluate the clinical relevance of a novel ankle–toe rehabilitation robot for training foot function.

Methodology: ATOBOT is a robotic system designed to provide coordinated ankle-toe rehabilitation across various postures. The ankle module provides assistive dorsiflexion to improve toe clearance and resistive plantarflexion to enhance push-off during gait. The toe module provides similar training to support balance and forward propulsion. A modular footplate with adjustable straps enables safe use in sitting, standing, and lying postures, supporting early intervention and progression across the continuum of care. Clinical relevance was assessed through a hybrid survey of 20 neurorehabilitation clinicians that evaluated the need for integrated ankle–toe therapy, the appropriateness of an assistive-resistive control strategy for functional gait tasks, applicability of multi-posture training, feasibility for routine use, and suggested design improvements.

Results: Feedback from clinicians, analyzed using descriptive statistics, showed strong endorsement for integrated training and the control strategy. Multi-posture training was valued for early intervention and progression. The device was rated as feasible considering standing safety.

Conclusion: ATOBOT addresses a critical neurorehabilitation gap by providing clinically feasible, integrated ankle–toe training across multiple postures.

Integrated Neuro-Physiotherapy for Tacrolimus-Induced Cytotoxic Encephalopathy Post-Allogeneic Stem Cell Transplant: A Case Report on Foundational Functional Recovery

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Aim: To examine the effect of a structured neuro-rehabilitation program on early trunk and postural recovery, fatigue, and quality of life in a patient with tacrolimus-induced cytotoxic encephalopathy following allogeneic stem cell transplantation.

Methodology: A 32-year-old male developed bilateral visual blurring of central origin, generalized weakness, severe ataxia, and impaired sitting balance after allogeneic stem cell transplantation for refractory Classical Hodgkin Lymphoma. Neuroimaging showed T2/FLAIR hyperintensities with diffusion restriction involving the parieto-occipital white matter, splenium of the corpus callosum, and pons. After medical stabilization, he completed a 12-week intensive neuro-physiotherapy program (90 minutes per day, 6 days per week). Rehabilitation focused on trunk stabilization, graded vertical orientation, multisensory integration, postural control, and sitting balance retraining. Progress was assessed using the Trunk Impairment Scale (TIS), Berg Balance Scale (BBS), Scale for the Assessment and Rating of Ataxia (SARA), Fatigue Severity Scale (FSS), and Functional Assessment of Cancer Therapy–Neurotoxicity (FACT-GOG/NTx).

Results: TIS improved from 2/14 to 9/14, indicating better static and dynamic sitting control. SARA improved from 31/40 to 25/40, reflecting reduced tremors with persistent ataxia. BBS remained at 2/56 due to inability to stand unsupported. Fatigue severity reduced, with a lower mean FSS score. FACT-GOG/NTx showed early improvement in sensory adaptation and functional well-being. The patient progressed from total dependency to assisted bed mobility and supported static standing balance.

Conclusion: Structured neuro-physiotherapy enabled foundational trunk and postural recovery. Monitoring fatigue and quality of life alongside motor outcomes helped guide rehabilitation intensity.

Clinical and Genetic Profile of Patients with Spinal Muscular Atrophy in Tertiery Care Hospital

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Spinal muscular atrophy (SMA) is a severe autosomal recessive neuromuscular disorder.

Aims:

1. To study clinical symptomatology & spectrum of severity of spinal muscular atrophy.
2. To study NCV and EMG pattern of various types of SMA and Genetic variation in SMA.

This cross-sectional observational study was conducted at a tertiary care hospital. Children aged 0–18 years with genetically confirmed SMA (SMN1 homozygous deletion) were included. Clinical features, EMG/NCV findings, SMN1/SMN2 genetic characteristics were assessed irrespective of treatment status. This study included 75 patients with SMA, male-to-female ratio of 1.3:1.Clinically SMA-2/Sitters constituted the majority (65.3%), followed by SMA-1/Non sitters (18.7%) and SMA-3/walkers (16.0%). Most SMA-1 patients (92.9%) were 1 year old, whereas SMA-2 predominantly were 1–10 years, and half of SMA-3 patients were >10 years. SMN2 copy number 2 was variable,1 copy number in SMA-2, 3 and 4 in SMA-2 and SMA-3.

Common complications: Scoliosis 53.1% in SMA 2 and 41.7% in SMA 3, while joint contractures 44.9% in SMA 2. Recurrent respiratory tract infections occurred in 57.1% of SMA-1 and SMA-2 patients. Constipation was more common in SMA-2 (18.4%). Only 1 patient had tracheostomy. Abnormal EMG (Denervation) and NCV findings were seen in 68.2% and 77.3% of patients, respectively.

Conclusion: SMA type 2 was the most prevalent, reflecting milder disease and better survival than SMA type 1, which showed early onset, rapid progression, and high mortality. Significant diagnostic and treatment gaps, limited therapy access, and common complications contributed to poor outcomes.

Water Swallow Test Across IDDSI Level 0-3 in Healthy Adults

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Water Swallow Test (WST) involves drinking water to objectively estimate swallow capacity of an individual. Of late, there has been a shift in practice from using water or thin liquids i.e., level 0 International Dysphagia Diet Standardisation Initiative (IDDSI), to thickened liquids (level 1–3 IDDSI) in the clinical swallow assessment. Aim objective To evaluate differences in volume/swallow (V/S), time/swallow (T/S) and swallow capacity (SC) for 100 ml of IDDSI levels 1 to 3 with level 0 in healthy adults.

Method: 90 healthy adults from 20–80 years participated in this cross-over study. Participants swallowed level 0 (thin), 1 (slightly thick), 2 (mildly thick), 3 (moderately thick) water at random order in separate sessions and the procedure was video recorded. Nestle ThickenUp Clear product was used to increase the viscosity of water to IDDSI level 1–3. Two Speech Language Pathologists, blind to type of IDDSI levels, independently analysed the video recordings to derive V/S, T/S and SC as per standard WST analysis.

Results: Results of the WST across IDDSI levels 0–4 of the study are summarised using descriptive data (mean, standard deviation, median and inter-quartile range) andinferential statistics (mixed analysis of variance). Specifically, the findings suggest that differences were noted in volumetric and temporal indices across young, middle and oldadults. Findings will also shed light upon potential sex differences in the performance of WST across IDDSI levels 0–4.

Conclusion: The present study showed differences in volumetric and temporal indices of swallowing physiology across IDDSI levels 1–3 with level 0 in healthy adults.

Hybrid Telerehabilitation After Soft Tissue Surgery in Spastic Diplegic Cerebral Palsy: Functional Outcomes and Barriers to Adherence

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Introduction: Spastic diplegic cerebral palsy often requires soft tissue surgery followed by intensive physiotherapy to optimize functional recovery. Telerehabilitation has emerged as a promising mode of service delivery, particularly in regions with limited access to pediatric physiotherapy services.

Aim: To report functional outcomes and identify barriers to adherence in a 4-year-old child with spastic diplegic cerebral palsy, classified as Gross Motor Function Classification System (GMFCS) Level III, residing in a remote area of West Bengal with no access to pediatric physiotherapy, who received hybrid telerehabilitation following soft tissue surgery and chemodenervation.

Methodology: A 4-year-old boy with spastic diplegic cerebral palsy (GMFCS Level III) underwent bilateral myofascial lengthening of the hamstrings and gracilis, along with chemodenervation of bilateral hamstrings and calf muscles. Postoperatively, a hybrid rehabilitation program comprising weekly online telerehabilitation sessions, hands-on physiotherapy by a local therapist, and a parent-assisted home exercise program was implemented. Gross Motor Function Measure (GMFM) served as the primary outcome measure. Results: Improvement was observed in gross motor function, particularly in standing and walking domains, as indicated by increased GMFM scores. Parents also reported better functional mobility during daily activities. Despite objective improvements, telerehabilitation sessions were discontinued due to child behavioral issues, refusal to participate in parent-assisted therapy, and decreased parental motivation once a perceived satisfactory level of function was achieved.

Conclusion: Hybrid telerehabilitation can yield meaningful functional gains following soft tissue surgery in children with spastic diplegic cerebral palsy, especially in underserved areas. However, sustained adherence is strongly influenced by behavioral and caregiver-related factors.

Atypical Presentation and Rapid Progression in a Case of Subacute Sclerosing Panencephalitis (SSPE): The Continued Threat of Measles in Post Vaccination Era

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Background: SSPE is a progressive, and fatal neurodegenerative complication of persistent wild-type measles virus infection, typically occurring years after primary measles exposure. Despite measles vaccination programs, cases persist in areas with incomplete immunization, highlighting ongoing public health risks.

Objective: To describe the clinical, radiological, and diagnostic features in a series of four pediatric SSPE cases, emphasizing atypical presentations, co-morbidities, and rapid progression.

Methods/Case Series: We report four children (ages 4–10 years): (1) a 7-year-old HIV-positive boy on HAART with focal myoclonus, ataxia, and cognitive decline; (2) a 10-year-old girl with intellectual disability, acute bilateral optic neuritis with behavioural changes; (3) a 7-year-old girl with fulminant onset featuring fever, severe ataxia, dysarthria, and refractory myoclonus; (4) a 4-year-old girl with Van der Knaap disease presenting with fever, seizures and choreoathetosis.

Results: Presentations varied markedly: two cases showed subacute progression with stabilization on symptomatic treatment, while two exhibited fulminant courses leading to death despite interventions. EEG findings included atypical periodic slow waves, diffuse slowing, and classic Radermecker complexes. MRI revealed asymmetric hyperintensities, optic nerve enhancement, and superimposed changes leukoencephalopathy. Co-morbidities appeared to influence disease severity and rapidity.

Conclusion: Clinical pleomorphism due to new mutation warrants high index of suspicion. Immune therapy and aggressive rehabilitation remains the mainstay of treatment.

Occupation-Based Occupational Therapy Rehabilitation Following Cervical Compressive Myelopathy in a Patient with Cerebral Palsy and Intellectual Disability: A Case Report

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Introduction: Cervical compressive myelopathy can significantly impair upper limb function, sensation, balance, cognition, and activities of daily living, often increasing caregiver dependence. Rehabilitation becomes more challenging in individuals with pre-existing neurological conditions such as cerebral palsy, seizure disorder, and intellectual disability. Occupational therapy plays a vital role in addressing functional limitations and participation restrictions through occupation-based intervention.

Aim: To describe the impact of an occupation-focused occupational therapy intervention on activities of daily living, upper-limb and hand function, balance during functional tasks, functional independence, and caregiver assistance in a post-operative cervical myelopathy patient.

Methodology: A 35-year-old male with C4–C5 disc prolapse and compressive myelopathy underwent anterior cervical discectomy and fixation. Pre-intervention assessment revealed spasticity, impaired hand function, sensory perceptual deficits, poor postural control, cognitive impairment, gait deviations, and high dependence in daily activities. An individualized occupational therapy program emphasized functional upper limb use, sensory re-education, perceptual and cognitive facilitation, balance within meaningful activities, ADL retraining, and vocationally relevant task-oriented training. Outcomes were evaluated using the Functional Independence Measure and occupational therapy–based functional performance analysis.

Results: During the first six weeks, intervention focused on balance, postural control, sensory–perceptual facilitation, and upper limb activation. The subsequent six weeks emphasized ADL retraining and vocational activities related to a family-owned hardware store. Improvements observed in self-care participation, functional upper limb use, and reduced caregiver assistance during routine activities.

Conclusion: This case highlights the effectiveness of individualized, occupation-based occupational therapy intervention in managing complex neurological presentations, reducing caregiver dependence, and enhancing functional independence, participation, and QOL.

Task-Oriented Occupational Therapy (OT) in a Young Adult with Longitudinally Extensive Transverse Myelitis

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Introduction: Transverse myelitis (TM) is a neurological condition marked by acute or subacute inflammation of the spinal cord causing sensorimotor deficits below the lesion, often accompanied by bowel and bladder dysfunction. LETM is a subtype defined by a T2 hyperintense lesion extending across 3 contiguous vertebral segments on spinal MRI and often results in reduced mobility, difficulty performing daily activities, and barriers to vocational participation. This case report highlights the effectiveness of OT in addressing these functional challenges in a young adult with LETM.

Aims: To enhance the role of OT in functional independence, motor skills, and quality of life in a young adult with LETM.

Methodology: A 20-Eleven systematic reviews published between year-old female presented with acute weakness in bilateral upper and lower limbs, progressive, accompanied by sensory deficits and bowel and bladder involvement. Clinical evaluation confirmed LETM in December 2025, and after medical stabilization, the patient was referred for OT. A personalized 12 week program based on MOHO and NDT approaches focused on task-oriented training, balance retraining, ADL retraining, adaptive strategies, fine motor training, and graded vocational rehabilitation for her role as a home-based tailor. Outcomes were assessed using the ASIA Scale, FIM–FAM, Berg Balance Scale, and Box and Block Test.

Result: Functional improvement observed, with the patient demonstrating independent ambulation with minimal support and enhanced performance in daily activities. Caregiver reports increased confidence and independence in routine tasks.

Conclusion: Continuum-based OT significantly enhanced functional independence in patient with TM. Focus on Task-oriented OT and vocational adaptation is vital for return to work and QOL.

Breaking Reflex Barriers: Effects of Reflex Integration Therapy on Motor Function and Daily Participation in Quadriplegic Cerebral Palsy

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Introduction: Cerebral palsy (CP) is a permanent, non-progressive neurodevelopmental disorder affecting movement and posture. Quadriplegic CP involves all four limbs and is commonly associated with poor postural control, impaired balance, retained primitive reflexes, and dependence in activities of daily living (ADLs). Persistence of primitive reflexes such as Asymmetrical Tonic Neck Reflex (ATNR) and Symmetrical Tonic Neck Reflex (STNR) interferes with voluntary movement, functional hand use, and mobility. Reflex integration therapy combined with Neurodevelopmental Treatment (NDT) aims to reduce reflex dominance and improve functional motor performance.

Aim: To determine the effectiveness of reflex integration therapy with NDT in improving functional motor performance and adaptive participation in self-care and mobility in a child with quadriplegic CP.

Methodology: A single-case study was conducted on a 6-year-old child with quadriplegic cerebral palsy, retained ATNR and STNR, classified as GMFCS Level III and MACS Level III. Functional outcomes were assessed using the Wee Functional Independence Measure (Wee-FIM) and Vineland Social Maturity Scale (VSMS). Intervention included primitive reflex integration therapy combined with NDT principles, use of key points of control, reflex inhibition patterns, facilitation of righting reactions, postural control training, and task-oriented ADL activities. Parents were actively involved, and home-based exercises were prescribed.

Results: Wee-FIM scores improved from 23/126 to 35/126, and VSMS Social Quotient increased from approximately 25 to 36. Improvements were also noted in motivation and therapy participation.

Conclusion: Reflex integration therapy combined with NDT produced meaningful improvements in postural control, voluntary movement, and participation in assisted self-care and mobility, despite ongoing dependence.

Play as a Pathway to Regulation: A Gestalt Play Therapy Based Occupational Therapy Case in Autism Spectrum Disorder

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Introduction: Autism Spectrum Disorder (ASD) is a neurodevelopmental condition marked by challenges in social communication, sensory modulation, emotional regulation, and functional participation. Sensory processing and self-regulation difficulties significantly impact play, attention, activities of daily living, and early school readiness. Play-based, relationship-centered approaches are vital in early intervention. Gestalt Play Therapy emphasizes present-moment awareness, emotional expression, and child-led interaction, offering a holistic framework when integrated with occupational therapy.

Aim: To evaluate the effectiveness of a sensory-based occupational therapy intervention integrated with Gestalt Play Therapy in improving emotional regulation, play skills, attention, and functional participation in a child with ASD.

Methodology: This single-case study involved a 4-year-2-month-old child diagnosed with ASD with sensory modulation and attentional difficulties. Baseline assessment using the Indian Scale for Assessment of Autism yielded a score of 97 (mild autism). Additional tools included the Vineland Social Maturity Scale, Vanderbilt ADHD Rating Scale, and Test of Playfulness. Intervention focused on sensory-based occupational therapy integrated with Gestalt Play Therapy principles, emphasizing child-led play, therapist–child attunement, emotional awareness, self-regulation, proprioceptive and vestibular input, graded tasks, visual supports, parent education, and sibling-mediated play. Pre-and post-intervention outcomes were compared.

Results: Test of Playfulness scores improved from −1 to 0, indicating developing play skills. VSMS scores increased from 81 to 85, reflecting improved social functioning. Clinically, gains were noted in emotional regulation, attention, play engagement, functional participation, postural control, and transition tolerance.

Conclusion: Integrating Gestalt Play Therapy within sensory-based occupational therapy enhanced self-regulation, play engagement, and functional participation in a child with ASD.

A Case Series on Use of Digitally Delivered Bibliotherapy in Children with Behavior and Emotional Problems

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Introduction: Emotional and behaviour problems in childhood involve difficulties in self-expression, limited cognitive resources for abstract reasoning, and reliance on symbolic modes of communication. Cognitive–behavioural therapy (CBT) is among the most empirically supported interventions for a wide range of childhood. However, children may at times find these methods abstract, demanding, or developmentally incongruent. Use of stories and narratives for therapeutic purpose called bibliotherapy when integrated with CBT framework can be useful in enhancing engagement and therapeutic alliance thereby having positive therapeutic outcomes.

Objective: To explore use of digitally delivered bibliotherapy in CBT sessions for children with behaviour and emotional challenges through thematic analysis of their follow report. Methods: Present case series consists of ten children in the age group 6-15 years with behaviour and emotional challenges. Children underwent therapy sessions that used digitally delivered bibliotherapy integrated with Cognitive Behaviour therapy approach. Thematic analysis of follow up therapy reports was conducted to asses changes in behaviour.

Results: Three themes emerged were Self-regulation and awareness, positive self-concept and Prosocial behaviors. Eight out of ten children had increased self-control, reduced anxiety and better coping. Positive self-concept was observed in 4 children and was reflected in reduced negative self-talk and greater confidence. Pro-social behaviour was evident in 4 children, with increased empathy, cooperation, and improved peer interactions.

Discussion: Case series analysis provides supporting evidence for using bibliotherapy as an adjunct therapeutic intervention with children. Findings direct towards a need for large size-controlled study and feasibility of digital content in therapy sessions. Keywords: Case-series, tele-rehabilitation

Parents Perceived Effectiveness, Attitudes and Barriers Towards Telerehabilitation of Neurodivergent Children

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Introduction: Neurodivergent children present with natural differences in brain functioning as compared to children who are considered typical. Rehabilitation services focus on enhancing their functional skills and making them independent in day to day life. Problems in access to care and barrier to mental health services for children remain persistent in Indian scenario and have been highlighted particularly during the COVID-19 pandemic. However, therapeutic modalities have had to evolve and adapt to the changing digital world. With increasing focus on connectivity, feasibility and accessibility, it becomes important to evaluate what caregivers/ parents of children who will be primary clients to tele-therapy think about these modalities.

Objective: To explore parental attitude, perceived effectiveness and barriers to tele-rehabilitation services for neurodivergent children.

Method: A short tailor-made survey questionnaire was developed for parents of neurodivergent children between the ages 8 to 18 years receiving services at a tertiary care centre in Mumbai. This questionnaire was evaluated by subject matter experts for use in this population before data collection.

Expected Outcomes: The study will help understand whether parents perceive such rehabilitation modalities to be useful and feasible for their children in day to day contexts. It examines barriers that will help therapists and professionals working in rehabilitation fields to anticipate concerns and develop effective tele-rehab modules, to reach remote populations.

Keywords: Tele-rehabilitation, parent perceived effectiveness, attitudes, barriers, neurodivergent, children

The Spectrum of Electroencephalographic Characteristics in Children with Autistic Spectrum Disorder at a Tertiary Care Centre

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Purpose: The prevalence of Epilepsy in children with autism spectrum disorder (ASD) is 5%–46%. There are high rates of epileptiform discharges seen on electroencephalography (EEG) in children with ASD without clinical seizures or epilepsy. This study was conducted to detect the prevalence and spectrum of EEG abnormalities in epileptic and nonepileptic ASD patients and comparison of EEG findings with the severity of ASD.

Method: A total of 140 cases with ASD were screened with history taking, physical, neurological, and neuropsychiatric evaluation. Clinical severity is graded by Indian Scale for Autism Assessment. EEG was performed in all cases irrespective of the history of epilepsy or seizures.

Results: The prevalence of EEG discharges (epileptic and non-epileptic) in our study was 45%, with epileptiform discharges seen in 28.44% of cases of ASD without seizure. Generalized tonic-clonic convulsion was the commonest seizure type in epileptic ASD cases while most common EEG changes were focal in frontal region. Most of EEG had shown well-formed background. The most dominant background rhythm was theta intermixed with delta followed by theta and delta intermixed with alpha in epileptic ASD children. Whereas, in children without clinical seizure, the dominant rhythm was delta-theta-alpha.

Conclusion: We would like to hypothesize that the predominant EEG changes in the frontal lobe may have some neuronal link in the pathogenesis of behavior pattern in ASD. We also propose that more detailed study with different types of EEG and with a larger sample size should be done in the future.

Impact of Neuro-Visual Rehabilitation on Vision-Related Quality of Life Following Epilepsy Surgery–A Pilot Study

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Introduction: Epilepsy surgery is an established treatment for drug-resistant epilepsy and is increasingly performed for seizure control and potential freedom from anti-epileptic drugs. However, procedures involving posterior cortical regions are frequently associated with visual field defects and higher-order visual processing impairments, leading to significant post-operative visual disturbances. Although visual sequelae such as field loss, reduced processing efficiency, and ocular motility disturbances are identified during neurological follow-up, structured neuro-visual rehabilitation remains underutilized. These deficits compromise functional vision and vision-related quality of life (VR-QOL). This study evaluated post-operative visual concerns and compared VR-QOL before and after structured neuro-visual rehabilitation.

Methodology: A pre–post interventional analysis was conducted in four patients with visual complaints following epilepsy surgery. Baseline assessment included comprehensive ophthalmological evaluation, visual field analysis, and VR-QOL measurement using the modified National Eye Institute–VFQ-25 questionnaire. Detailed neuro-visual assessment, Peli prism trial for field expansion, and individualized rehabilitation comprising in-office vision therapy and home-based technology-supported therapy (EyeBab and Neurapy) were implemented. Pre- and post-intervention VR-QOL scores were compared. Results: Four patients (mean age 18 years; range 13–24) were included; 75% had left parieto-occipital involvement. Pre-operatively, one had decreased vision with homonymous hemianopia, while three had normal fields and acuity. Post-operatively, all developed homonymous hemianopia. Functional evaluation suggested additional cortico-visual impairment in all. All had mobility difficulties and were unable to adapt to Peli prisms. Mean rehabilitation duration was 3.3 months. Median VFQ score improved from 0.63 to 0.45, indicating clinically meaningful improvement.

Conclusion: Structured neuro-visual rehabilitation improved VR-QOL despite persistent field loss.

Evaluation of Symptom Severity Changes After Transcranial Photobiomodulation in Children with Autism Spectrum Disorder: A Retrospective Comparative Study

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Background: Autism Spectrum Disorder(ASD) is characterized by impairments in social communication and restricted, repetitive behaviors. Transcranial photobiomodulation(tPBM) has emerged as a neuromodulation intervention aimed at enhancing neuronal metabolism and cerebral perfusion; however, clinical evidence in pediatric ASD remains limited.

Objective: To evaluate changes in symptom severity following transcranial photobiomodulation in children with ASD using retrospective clinical data.

Methods: A retrospective comparative study was conducted using records of 20 children with ASD who attended Sparsh Pediatric Rehabilitation Clinic. Participants were divided into an experimental group(n=10; received tPBM + conventional therapy) and a control group(n =10; received conventional therapy alone). The intervention duration was 12 weeks. Symptom severity was assessed using the Childhood Autism Rating Scale(CARS) and parental stress using the Autism Parenting Stress Index(APSI). As normality assumptions were violated, non-parametric tests were applied. Wilcoxon Signed Rank Test for within group analysis and Mann-Whitney U test for between-group comparisons.

Results: Both groups demonstrated significant reductions in CARS and APSI scores post-intervention($p < 0.01$). However, between-group analysis revealed significantly greater improvements in the experimental group compared to the control group for CARS($U = 2.000$, $Z = -3.680$, $p < 0.001$, $r = 0.82$) and APSI ($U = 6.000$, $Z = -3.431$, $p = 0.001$, $r = 0.77$), indicating large effect sizes.

Conclusion: Transcranial photobiomodulation combined with conventional therapy was associated with significantly greater reductions in autism symptom severity and parental stress compared to conventional therapy alone. Larger prospective studies are warranted to confirm these findings.

Keywords: Autism Spectrum Disorder, Transcranial Photobiomodulation, CARS, Neuromodulation

New-Onset Progressive Gait Impairment After Successful Stroke Rehabilitation: Diagnostic Challenges in a Stroke Survivor

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Introduction: New-onset gait impairment in stroke survivors who previously achieved good functional recovery poses diagnostic and rehabilitation challenges. Non-neurological comorbidities may mimic neurological deterioration. Comprehensive evaluation using the WHO International Classification of Functioning framework and broad differential diagnoses are essential to optimise outcomes.

Case Description: A 41-year-old female from Colombo sustained a brainstem hemorrhagic stroke in July 2021, resulting in left hemiplegia. Following posterior fossa craniotomy and structured rehabilitation, she achieved independent indoor ambulation with a quad cane. After discontinuing follow-up, she re-presented in November 2025 with progressive gait difficulty over 12 months.

She had worsening spasticity, left hip girdle weakness, post-stroke depression, deconditioning and an overlay of functional neurological disorder. She required assistance for all activities of daily living and a wheelchair for mobility. A history of a fall in December 2024 with mild hip pain was elicited. Examination demonstrated restricted passive hip range of motion and sensory impairment in the left lower limb. Neuroimaging excluded recurrent stroke but musculoskeletal imaging revealed an old neck of femur fracture with extensive heterotopic ossification, likely missed due to impaired pain perception. Orthopedic management was conservative.

Following eight weeks of intensive multidisciplinary rehabilitation targeting hip range of motion, strengthening, balance, sensory re-education, gait and psychosocial support; she regained indoor ambulation with a quad cane, independent transfers, improved mood and quality of life.

Discussion: New gait deterioration in stroke survivors warrants systematic evaluation for neurological and non-neurological causes. Multidisciplinary assessment, individualized goal setting, and structured rehabilitation can facilitate meaningful functional recovery.

Effect of Vertigo School Protocol on Functional Mobility and Dizziness Related Disability in Patients Diagnosed with Benign Paroxysmal Positional Vertigo

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Introduction: Benign Paroxysmal Positional Vertigo (BPPV) is a common peripheral vestibular disorder characterized by brief episodes of vertigo triggered by changes in head position. It occurs due to abnormal stimulation of the semicircular canals, most commonly the posterior canal, resulting in a false sensation of movement. Although the condition is benign and non-progressive, many individuals continue to experience residual dizziness and imbalance even after successful canalith repositioning manoeuvres, which can affect functional mobility and daily activities.

Aim: To evaluate the effectiveness of the Vertigo School Protocol (VSP) in improving functional mobility and reducing dizziness-related disability in individuals with BPPV.

Method: Thirty-five individuals diagnosed with BPPV were recruited based on predefined inclusion and exclusion criteria. Baseline assessment was performed using the Dizziness Handicap Inventory (DHI), Visual Vertigo Analogue Scale (VVAS), and Timed Up and Go (TUG) Test. Participants underwent a structured vestibular rehabilitation program based on the Vertigo School Protocol, including patient counselling, supervised training sessions, and a home exercise program. The intervention consisted of 12 sessions over four weeks. Post-intervention assessments were conducted using the same outcome measures.

Results: All participants completed the intervention. Statistical analysis showed significant improvements in DHI, VVAS, and TUG scores following the intervention ($p < 0.001$), indicating reduced dizziness-related disability and improved functional mobility.

Conclusion: The Vertigo School Protocol was effective in reducing dizziness-related disability and improving functional mobility in individuals with BPPV.

Comparing the Effects of Aquatic and Land-Based Exercise on Balance and Fall Risk in Patients with Diabetic Neuropathy: A Single Blinded Randomized Controlled Trial

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Background: Diabetic peripheral neuropathy (DPN) commonly leads to sensory deficits, impaired balance, and increased risk of falls. Exercise-based rehabilitation programs are widely used to improve balance and functional mobility in this population.

Aim: To compare the effectiveness of land-based and aquatic-based balance training in adults with diabetic peripheral neuropathy.

Method: A single-blinded randomized controlled trial was conducted among 56 participants aged 40–75 years diagnosed with DPN. Participants were randomly allocated using the Sequentially Numbered Opaque Sealed Envelope (SNOSE) method into two groups: land-based training (n=28) and aquatic-based training (n=28). Both groups completed a four-week structured exercise program based on the Fitness and Mobility Exercise (FAME) protocol. Balance and mobility were assessed using the Berg Balance Scale (BBS) and Timed Up and Go (TUG) test.

Results: Both groups demonstrated statistically significant improvements following the intervention ($p < 0.05$). Mean BBS scores increased, indicating improved postural stability, while TUG times decreased, reflecting enhanced functional mobility and reduced fall risk. Improvements were maintained at the one-month follow-up. However, no statistically significant difference was observed between the two groups.

Conclusion: Both land-based and aquatic balance training were effective in improving balance and mobility in individuals with DPN. Aquatic therapy can therefore be considered a practical alternative to conventional land-based rehabilitation.

Effect of Brain Gym as an Adjunct to Conventional Balance Exercise on Balance and Fear of Fall in Geriatric Population – A Randomized Control Trial

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Introduction: Global population ageing has increased fall prevalence among older adults. Age-related decline in neuromuscular strength, sensory integration, and postural control impairs balance and elevates fall risk. Recurrent falls may lead to fear, activity restriction, reduced independence, and functional decline, highlighting the need for effective fall-prevention interventions.

Aim: To evaluate the effectiveness of Brain Gym as an adjunct to a conventional balance exercise program in improving balance and reducing fear of falling among community-dwelling geriatric individuals.

Method: 42 participants were screened using inclusion and exclusion criteria and allocated into two groups using simple randomization: Group 1 (Conventional Balance Exercises) and Group 2 (Brain Gym + Conventional Balance Exercises). Baseline assessment included the Berg Balance Scale and Falls Efficacy Scale–International. Both groups received 12 sessions over 4 weeks (3 sessions/week) with an alternate-day home program. Post-intervention reassessment and a 1-month follow-up for FES-I were conducted.

Results: Both groups demonstrated improvement following the intervention; however, the group receiving Brain Gym along with conventional exercises showed greater reduction in fear of falling. These improvements were maintained during the follow-up assessment indicating sustained benefits of the combined intervention.

Conclusion: Adding Brain Gym exercises to conventional balance training was more effective in addressing the psychological aspects of balance and fear of fall & improving confidence in functional activities thus providing a holistic approach for geriatric population.

Effect of Lee Silverman Voice Treatment-Big vs Hibalance on Gait and Balance in Patients with Parkinson's Disease

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Background: Parkinson's disease is a progressive condition characterized by motor symptoms such as bradykinesia, tremors, rigidity, and postural instability, affecting about 8.5 million people worldwide in 2019 according to the Global Burden of Disease Study.

Gait and balance impairments are common and significantly reduce mobility and quality of life. Rehabilitation programs like LSVT BIG and Hibalance Program aim to address these motor deficits. LSVT BIG uses high-amplitude intensive movements, while Hibalance focuses on dynamic balance, sensory integration, and dual-task training to improve postural control and functional mobility.

Aim and Objective: To assess the effect of Lee-Silverman Voice Treatment- BIG vs Hibalance protocol on Gait and Balance in People with Parkinson's Disease.

Method: A total of 56 subjects were screened and randomly allocated into two groups: LSVT BIG and Hibalance. Baseline and post-intervention assessments were conducted using MiniBest, Dynamic Gait Index, 10-Meter Walk Test, and 5 Times Sit-to-Stand Test.

Results: Intragroup analysis showed statistically significant improvement ($p<0.05$) in outcome measures after both LSVT BIG and the Hibalance program, indicating effectiveness in improving motor performance in individuals with Parkinson's disease.

Intergroup comparison did not show a statistically significant difference between the groups.

However, mean change scores indicated greater improvement in the LSVT BIG group, suggesting comparatively better gains in the measured outcomes

Conclusion: Both LSVT BIG and the Hibalance program were effective in improving balance and functional mobility in individuals with Parkinson's disease. However, the greater mean improvements with LSVT BIG suggest that amplitude-based, high-intensity training may produce better functional outcomes.

Stakeholder Perspectives on Designing a Robotic Hand Assessment for Stroke Rehabilitation: A Qualitative Study Employing Focus Group Discussion

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Introduction: The integration of robotics in stroke rehabilitation could potentially offer promising opportunities for enhancing hand function assessment. Robotic systems provide more precise, reliable, and objective evaluations compared to traditional methods.

Aim: To describe the process of designing a robotic hand assessment battery and perspectives of different stakeholders in the development process.

Methodology: We conducted a qualitative study using focus group discussions (FGDs) with clinicians, bioengineers and people with lived experience of stroke. The participants were sent a video and reading material regarding the robotic system to be discussed. The FGDs were facilitated in an impartial and unbiased manner. Each session lasted approximately 60-75 minutes and was guided by semi-structured questions. All the FGDs were recorded, transcribed and thematically analysed.

Results: Eighteen individuals (8 women and 10 men) participated in three FGDs. The mean age of the participants was 31±6 years. The clinicians had a mean experience of 9 ± 3 years of working with stroke, while the engineers had 7 ± 2 years of professional experience. The major themes identified included challenges with existing hand assessment measures, the potential of robotics as an assessment tool, barriers to implementing robotics in routine clinical practice, and concerns regarding usability and safety.

Conclusion: While stakeholders supported the precision and customization offered by robotic tools, they also raised important concerns regarding usability, data interpretation, training needs, safety, and affordability. Future development of systems like PLUTO should incorporate real-time data visualization, multi-joint evaluation capabilities, and clinician-friendly interfaces to enhance both adoption and clinical relevance.

Development of a Comprehensive Home Intervention Program (HIP) for Caregivers to Facilitate Participation in Children with Cerebral Palsy

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Background: Children with cerebral palsy face challenges in daily activities due to physical limitations, reducing participation. Although they receive clinical and home-based intervention programs but these programs often lack structure; structured home programs are practical in resource-limited setting like India.

Aim: To develop a comprehensive home intervention program for caregivers to facilitate participation in children with Cerebral Palsy.

Method: The program will be developed in accordance with the Medical Research Council Framework. It will involve reviewing current literature on the topic, identifying relevant theories, and modeling the process and estimates. An extensive literature review will be conducted to identify existing literature on home program interventions, techniques, modules, and occupational therapy outcomes for children with Cerebral Palsy. Based on the literature review, relevant theories and models guiding occupational therapy will be selected. OT intervention strategies and expected outcomes will be determined through an interactive process.

Result: The caregiver will receive education and training on the home intervention program (HIP). The program will include the total number of sessions, the mode of delivery, and session-by-session participation components for children with CP. A home program pamphlet or booklet will be provided to facilitate adherence to HIP.

Conclusion: A structured, comprehensive home intervention program for caregivers will be effectively developed using the MRC framework. It aims to promote continuity of care beyond the hospital setting and could assist mothers in delivering interventions at home. Future research should evaluate its feasibility, effectiveness, and long-term outcomes. A subsequent phase of feasibility and effectiveness is recommended.

Patient Satisfaction Among Those Receiving Physiotherapy Via Telerehabilitation Using the 'Physical Therapy Telerehabilitation Satisfaction Questionnaire'

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Background: Understanding patient experiences with telerehabilitation helps identify its strengths, limitations, and areas requiring improvement. Hence the aim of this study was to analyze patient satisfaction among individuals receiving physiotherapy via telerehabilitation using the Physical Therapy Telerehabilitation Satisfaction Questionnaire(PTSQ) was developed with overall score of 100, consisting of 20 items. There are 5 questions in each of the 4 domains. with a score of 25 each namely, 1) Quality of healthcare provided during telerehabilitation sessions, 2) Interpersonal manners and communication, 3) Accessibility and convenience and 4) Overall Experience. Its reliability and validity was assessed and an online survey among 98 individuals receiving physiotherapy through telerehabilitation aged more than 18 yrs of age was conducted and descriptively analyzed.

Results: A Cronbach's Alpha of 0.897 showed excellent internal consistency. A Costruct validity using Kaiser-Meyer-Olkin (KMO) with a value = 0.856 and Bartlett's Test $p < 0.001$ confirmed the suitability for factor analysis Exploratory factor analysis identified five factors explaining about 59.7% of total variance.. Majority of participants reported Agree" or "Strongly Agree" indicating high satisfaction with telerehabilitation. The median values of 4 Domains were: 21(19,23), 22(20,24), 20(19.25,23) and 19(18,21) respectively and overall total was 83(76, 88,75).

Conclusion: The PTSQ showed strong reliability and good validity and hence, can be used to assess patient satisfaction in telerehabilitation services. Subjects reported high levels of satisfaction, making Telerehabilitation a useful Tool to deliver services to a larger population while maintaining effective patient interaction through digital platforms and enhance the Quality of life.

-Roli Rastogi

While freedom of speech is our acclaim,
Diverse disabilities often face a silent and unseen frame.

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