

## Preface: Challenges in Rehabilitation

Physical and Rehabilitation Medicine involves many disciplines of medicine and surgery. Both physicians and surgeons appreciate the input and expertise from physiotherapy, kinesiology, biomedical engineering, occupational therapy, and other health professions to assist the patient to achieve functional goals. In this issue of *Critical Reviews™ in Physical and Rehabilitation Medicine*, we highlight the following specific areas of physical and rehabilitation medicine, namely, factors affecting kinematics of upper extremity, nonpharmaceutical treatment of dental anxiety, recovery following stroke, spine care, surgery in children with cerebral palsy, contextual factors influencing function after lower extremity amputation in low- to middle-income countries, and rehabilitation of sacroiliac joints.

The paper by P. Ponvel, D. Kaur Ajit Singh, G.K. Beng, and S.C. Chaic, Factors affecting upper extremity kinematics in healthy adults: A systematic review, examines the literature for factors that affect upper extremity (UE) kinematics during functional movements and activities of daily living among healthy adults. They identify age, gender, physical activity level, body mass index, limb dominance, features related to the target (target size and target position), and social interaction as critical factors for UE kinematics. However, it is concluded that there is no single dominant factor that can affect the functional movements involving UE. It is suggested that a health caregiver must examine each patient and decide an optimum method of treatment if there is a pathological condition.

Dental anxiety is a fear or phobia associated with dental procedures in both children and adults. Several nonpharmacological techniques are used to overcome dental anxiety and identify which behavioral therapy serves the patient most effectively. The paper by A. Kuhad, The use of nonpharmaceutical therapies to help decrease and alleviate dental anxiety in the adult population, examines cognitive behavioral therapy, hypnotherapy, music distraction, and acupuncture as treatment modalities to reduce dental anxiety in both adult and pediatric patients. Of these, cognitive behavioral therapy is most often used by dentists because it provides the most compelling evidence in allowing patients to overcome their dental anxiety. In children, handheld distraction and behavioral therapy can mitigate dental anxiety. Assistance to the dentist in the form of technology, especially using gaming software, to distract the child with dental anxiety is still in the early stages of research.

Both neuromuscular electrical stimulation (NMES) and mirror therapy (MT) have been found to be effective adjuvant treatments for motor and functional recovery in stroke rehabilitation: NMES uses electric pulses for inducing contractions of paralyzed or paretic muscles. MT is a cognitively induced intervention that introduces visual illusion of the paretic limb through movements of the healthy limb with external feedback using a mirror. The paper by V. Pagilla, V. Kumar, A. Joshua, M. Chakrapani, Z.K. Misri, and P. Mithra, A top-down versus a bottom-up approach on lower extremity motor recovery and balance following acute stroke: a pilot randomized clinical trial, compares the efficacy of NMES and MT for lower-extremity motor recovery and balance among

stroke survivors on 30 stroke patients who were referred for rehabilitation (onset < 3 weeks). It is concluded that an eclectic approach is an effective adjunct treatment in very early phases of poststroke rehabilitation, regardless of NMES or MT use.

Sacroiliac joint dysfunction is characterized by local pain and functional impairment. The paper by H. Kaur, M. Sharma, and A. Hazari, Effectiveness of Maitland mobilization and Mulligan mobilization in sacroiliac joint dysfunction: a comparative study, evaluates the effectiveness of Maitland mobilization and Mulligan mobilization in sacroiliac joint dysfunction on 60 participants affected by the joint dysfunction. Their results show that both methods of mobilization are effective in improving the function of the sacroiliac joint and reducing pain. However, they conclude Mulligan mobilization may be more effective in reducing disability of sacroiliac joint dysfunction.

Among children with cerebral palsy, single event multi-level surgery (SEMLS) is the most preferred surgical intervention. Review of the literature suggests that, following SEMLS, improvement is reported in isolated outcome variables of function such as gait, mobility, and self-care. However, comprehensive evaluation of functional outcome needs further exploration based on the WHO ICF model to gain a complete understanding of lower extremity function following SEMLS. Refer to the paper, Review of lower extremity function following SEMLS in children with cerebral palsy by R. Mullerpatan, T. Shetty, S. Ganesan, and A. Johari.

Similarly, in Evidence-based rehabilitation of spine pain disorders among underserved individuals in Navi Mumbai, India, this issue presents a two-year observational report based on the outcome of a care delivery model in the paper by R. Mullerpatan, P. Giridhar, Y. Singh, K.R. Salgotra, A. Wilkey, and M. Nordin. Evidence-based, sustainable, and affordable spine care organized at a tertiary care teaching hospital in collaboration with World Spine Care resulted in rehabilitation of 2,244 patients with spine pain disorders among the underserved people in Navi Mumbai in India. Following spine care, which included exercises and manual therapy, 50% of patients were discharged with self-care, emphasizing self-empowerment.

In addition to papers exploring function and challenges encountered in rehabilitation of patients following impairments, a review by R. Mullerpatan, M. Sonkhia, B. Thomas, S. Mishra, A. Gupta, and B. Agarwal, Review of contextual factors influencing function following lower extremity amputation in low- to middle-income countries presents exploration of contextual factors influencing functional outcome following lower extremity amputation (LEA). The review revealed that external factors, such as lack of awareness, inadequate rehabilitation and prosthetic services, lack of social security systems, health insurance, poor quality and/or durability and high-cost of prosthesis, poor transport facilities and level of education in low- to middle-income countries, were strongly linked with poor functional outcome, dissatisfaction, and participation restriction. Low income, inaccessible environment, and social stigma associated with amputation reduced functional outcome and community participation. Internal factors, such as poor coping strategies, negative self-esteem, old age, female gender, and negative body image, were linked with poor functional outcome; whereas, strong family support improved participation of people with LEA.

To summarize, the current issue reviews specific challenges in rehabilitation of children and adults with dental anxiety, cerebral palsy, people with lower extremity amputations, spine pain disorders, and stroke in addition to reviewing factors influencing kinematics of the upper extremity during various functional activities. Information contained in these papers is a rich learning resource, especially for training healthcare professionals.

Emerging specialization within the rehabilitation field is providing excellence in patient care and in parallel brings together professionals from a variety of disciplines such as physiotherapy, occupational therapy, dentistry and engineering in conjunction with physicians and surgeons to address significant research questions through interdisciplinary and collaborative research at the national and international level.

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