

Rehabilitation Medicine – The Final Frontier

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Three stages of epidemiologic transitions have come and passed.¹ The first age of pestilence and famine was characterised by high birth rates and mortality. The advent of antibiotics heralded the second age of pandemic recession with subsequent exponential population growth. The third age of chronic, degenerative and man-made diseases was marked by the development of modern medicine, low birth rates and mortality. We now arrive at this final age. Advances in modern medicine and increasing longevity result in disability, diminished quality of life and a tremendous societal burden. The World Health Organization (WHO) reports that more than a billion people in the world face disability every day.² This number is more than any single disease. A fresh strategic paradigm is needed to face the enemy onslaught of disability.

Rehabilitation is the core weaponry in disability management. It enables the improvement, optimisation and maintenance of practical function across a wide range of diseases.³ Rehabilitation medicine is the medical specialty that prescribes rehabilitation as its integral therapeutic modality.^{3,4}

Overall operational plans have gradually emerged.⁵ The recently developed WHO-International Classification of Functioning, Disability and Health (WHO-ICF) model provides the guiding map in the battle quagmire (Fig. 1).^{2,5} It categorises the impact of disease into impairments of body structure and function, activity limitation and participation restrictions, and recognises the critical influence of environmental and personal contextual factors including self-efficacy and motivation.^{2,5} The WHO-ICF also emphasises health and not merely the absence of disease or disability. It further emphasises the importance of community participation including mobility, work, leisure and interpersonal relationships to optimise function and quality of life.

Clinicians, researchers and administrators can now objectively assess outcomes and provide interventions in these domains while maintaining a clear focus of the overall rehabilitation thrust.⁴ Indeed, shifts in healthcare funding from pure diagnostic-related group (DRG) casemixes to incorporate functional-related group (FRG)-based subventions recognise the additional impact and costs of disability.⁶

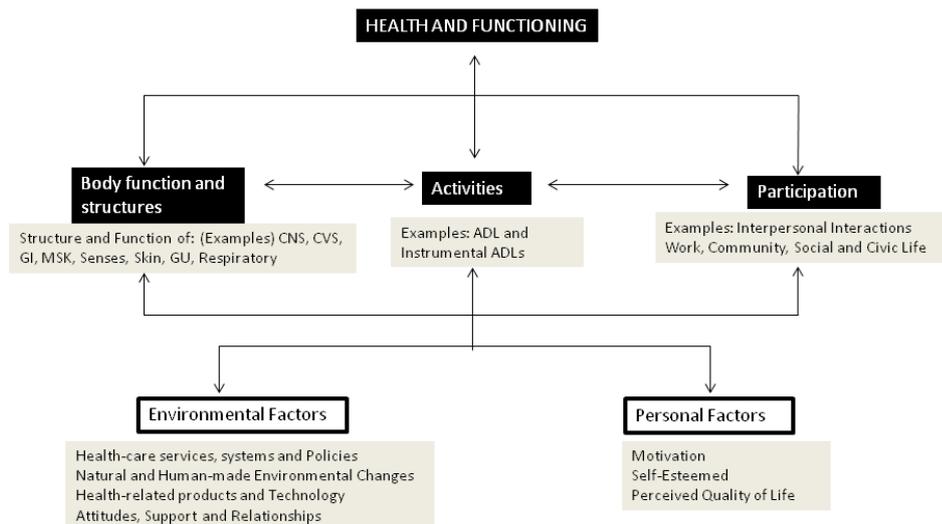


Fig. 1. The WHO-International Classification of Functioning, Disability and Health. The emphasis is on health and functioning in society, rather than impairments and disability. ADL: Activities of Daily Living; CNS: Central nervous system; CVS: Cardiovascular system; GI: Gastrointestinal; GU: Genitourinary; MSK: Musculoskeletal;

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Hippocrates' precept on medical practice to “cure sometimes, relieve often and comfort always” further translates to another important rehabilitation principle of restoration and compensation.⁷ For each rehabilitation goal in the WHO-ICF domains, we aim to reconstitute where possible or apply compensatory strategies and provide environmental modifications when we cannot. For example, in a hemiparetic stroke, reaching tasks are achievable by strengthening the weak arm, compensating with the non-affected arm or modifying the environment by placing objects closer to the patient. The recent deployment of rehabilitation technology further illustrates this. There are training robots that aim to restore strength or walking, assistive technology (AT) such as wheelchairs and prosthetic limbs that substitute or compensate for motor impairments and public buses with automated wheelchair platforms that provide environmental modifications for community access.^{3,7}

There is rapid progress in the development of rehabilitation sciences with significant increases in both the absolute volume and quality of research publications in diverse rehabilitation fields.⁸ In the rehabilitation of neurological conditions, facilitating neuroplasticity through neuromodulation and sensorimotor learning has transformed contemporary practice.⁹ Developments in the use of modulatory medications, constraint-induced therapy, brain-computer interfaces, non-invasive brain stimulation, virtual reality and rehabilitation robotics improve a wide variety of outcomes.³ Musculoskeletal rehabilitation is characterised by the increasing use of objective imaging and advanced assessment tools such as ultrasound and biomechanics laboratories for rapid diagnosis and focused rehabilitation. Early comprehensive rehabilitation programmes after a major acute event have proven safe and effective in intensive care, cardiac and pulmonary rehabilitation with encouraging reductions in lengths of stay, readmissions and morbidity.^{4,10} Cancer rehabilitation is a fast growing field of rehabilitation as survival rates increase, demanding specific approaches to specific impairments such as weakness, fatigue and cancer-related pain.¹¹ Paediatric rehabilitation is a significant need and practitioners require a broad knowledge of genetic, congenital and childhood diseases and disability, and interventions accounting for ongoing physiological and social development.¹² Geriatric rehabilitation has assumed national importance in developed countries with ageing populations and demonstrates yet another paradigm shift in rehabilitation. It emphasises community screening for the frail elderly and delivering pre-rehabilitation through a core exercise programme in otherwise healthy elders prior to the onset of disability.¹³

Systems of rehabilitation care have also concurrently developed.^{3,4} These include the initiation of national rehabilitation databases to optimise limited resources

and integrated pathways incorporating rehabilitation in common diseases. The early delivery of rehabilitation in intensive care units, early supported discharge programmes, regional health systems integrating acute and rehabilitation (community) hospitals, streamlining of outpatient rehabilitation and rehabilitation in nursing homes address increasing demands and raise rehabilitation standards.^{3,10,14} Community rehabilitation including return to work, psychosocial support programmes and innovations such as remote telerehabilitation are important and continue to be developed.^{11,15} An unfilled gap is the need for adolescent rehabilitation to manage yawning chasms in the transitions from childhood to young adulthood for congenital, developmental and acquired chronic disabilities. These need to be seamlessly and actively managed in order to allow the fulfillment of maximal functional and societal potentials where possible, and reduction of parental and sibling burdens.¹²

The battle requires not individuals, but a cohesive fighting force. There is an urgent need to train not just more rehabilitation clinicians to meet increasing demand for rehabilitation services but also to teach principles of rehabilitation to all healthcare clinicians. Competent functional assessments should be in the armamentarium of all physicians and transdisciplinary care models the norm in integrated rehabilitation.^{4,5} High quality research is needed to identify promising interventions and to improve rehabilitation services delivery. Further, the army needs champions and rehabilitation medicine leaders are well poised to advocate for the frail and disabled in our society by prescribing rehabilitation to improve function, quality of life and health.

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