

Stroke Rehabilitation: Multidisciplinary Perspectives

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Social and scientific data support the growth of the field of stroke rehabilitation (and neurorehabilitation more broadly). From a societal perspective more people with stroke need rehabilitation. Worldwide, there are estimated to be 62 million stroke survivors (Strong, Mathers, & Bonita, 2007), with the proportion of disabled survivors increasing over time (Carandang et al., 2006). Scientifically, evidence from animal and human studies demonstrates the importance of skill training and learning on facilitating neural plastic changes (Carey & Seitz, 2007; Nudo, 2007). Our challenge is to translate our understanding of the brain and behaviour into clinical practice so that we can improve the quality of life of those we treat. These advances need to be implemented in the wider context of stroke rehabilitation as it affects individuals, the family, service provision, population health and productivity.

In this special issue on stroke rehabilitation we sought to bring together a multidisciplinary perspective on issues that impact stroke rehabilitation. Authors come from a range of disciplines including geriatrics, neurology, occupational therapy, physiotherapy, speech pathology, nursing, epidemiology, experimental psychology and neuropsychology. Moreover, topics discussed in each article typically involve a contribution from more than one health professional, most of whom have both clinical and research expertise. Importantly, an international perspective is reflected with input from authors from the United Kingdom, Europe, the United States, and Australia.

The articles include theoretical reviews and empirical studies. Topics discussed range from those that directly impact on an individual's rehabilitation such as neural plasticity and motor learning, handgrip limitation, and treatment compliance, to the potential role of family members in rehabilitation and the relationship between social support and the informal caregiver role. The impact of stroke on return to work and communication outcomes is also discussed. Finally, future directions for aphasia therapy, conduct of clinical rehabilitation trials and the

benefits and challenges of stroke research in developing countries provide direction for future rehabilitation and research. It is anticipated that many of these issues, as summarised below, will also be of direct relevance to rehabilitation of brain impairment in other patient groups.

Professor Lindley in his stroke rehabilitation commentary provides a succinct overview of the main issues facing health care providers working in stroke. In particular, he highlights the interventions that are known to be effective, the evidence–practice gaps that exist in providing best practice care, the importance of conducting research in stroke units and the potential way forward in the advancement of stroke rehabilitation to maximise the potential for recovery.

The value of rehabilitation and need to adopt approaches based on neuroscience has intensified over the past decade. Seitz, Matyas, and Carey review the literature on neural plasticity as a basis for motor learning and neurorehabilitation. Advances in our understanding of motor learning and neural plasticity, gained from behavioural and neuroimaging studies, provide direction for current and future rehabilitation of motor functions.

The relationship between sensory discrimination of object slip and handgrip limitation is examined by Blennerhassett, Carey, and Matyas in a sample of 45 stroke survivors. The findings support the conclusion that impaired somatosensory processing may contribute to handgrip limitation following stroke, and recommend that attention be directed to processing of tactile cues arising between the object and skin when training handgrip ability.

Adherence to treatment impacts on the likely success of rehabilitation programs. Coetzee, Andrewes, Khan, Hale, Jenkins, Lincoln, and Disler investigated factors that predict adherence to treatment (i.e., medication) in stroke patients, in comparison to amputee patients. Factors contributing to poor adherence included emotional and cognitive dysfunction, beliefs about medication, and social support.

A potential, low-cost resource for expanding the resources available for rehabilitation is involving family members in conducting specific interventions at home. Carey and Matyas investigate this potential in a pilot study of sensory retraining post-stroke. The findings indicated that selected surrogate therapists (spouses) can successfully implement the program in home environments when provided training and supervision by a qualified therapist.

Little is known about the long-term impact of the caregiver role for those providing informal care to stroke survivors. Authors Cumming, Cadilhac, Rubin, Crafti, and Pearce have provided evidence that the outcome for carers in a prospective long-term follow-up study of stroke survivors and carers in Australia may be related to the amount of social support received. They report that increasing social support was correlated with lower levels of depression, anxiety and inward irritability in caregivers. It was concluded that social support may be an important factor in lowering psychological burden in these caregivers.

Stroke has a marked impact on the ability to return to work. Radford and Walker discuss the range of factors that impact on return to work. However, vocational rehabilitation services are often scarce. It is suggested that people with stroke need specialist vocational rehabilitation services and that service developers need to address the factors that enable or impede return to work after stroke when designing these services.

Macrae and Douglas describe outcome for elderly aphasic stroke survivors in terms of communication ability and discharge destination at 12 months post-stroke. This knowledge is needed to enable adequate provision of speech pathology services. The study found that language function improved even in the old/very old stroke survivor with severe language impairment, and that more than half were living in residential care. The need for systematic review and follow-up speech pathology services that operate effectively in residential care environments is highlighted.

Recent developments and future directions for aphasia therapy are discussed by Professor Holland. Themes discussed in her review include advances in neuroscience and implications for aphasia management, shift from impairment focus to daily activities and participation, social approaches to management, and application of technology in treatment.

Monitoring of the therapy dose within a clinical trial is important to achieve trial quality. The article by Collier and Bernhardt describes procedures employed to monitor interventions delivered during a randomised controlled trial of very early

mobilisation plus standard care versus standard care alone. Strategies found to improve compliance with trial protocol are discussed.

Two thirds of the burden of stroke occurs in developing countries. Fitzgerald, Srikanth, Evans, and Thrift discuss the benefits and challenges of conducting stroke research in developing countries. In particular, the issues, impediments and opportunities faced by researchers in undertaking population-based studies on the burden of stroke are highlighted. The authors identify important guidelines for the successful conduct of such studies.

Together these reviews and empirical papers have highlighted a range of issues important to successful rehabilitation following stroke. The impact on the individual, the family, service provision and future directions in clinical practice and research have all been touched on, highlighting the scope of the challenge we face. Importantly, health professionals from a wide range of disciplines are coming together to address these issues from both clinical and research perspectives. Guidelines for clinical practice that draw on this evidence are being made available for health professionals and consumers. For example, in Australia *Guidelines for Stroke Rehabilitation and Recovery* (National Stroke Foundation, 2006) have recently been developed by a multidisciplinary working party and endorsed by professional groups and our National Health and Medical Research Council. Our task now is to implement current evidence in clinical practice and to set the agenda for stroke rehabilitation research. Only with ongoing commitment, a multidisciplinary approach and clear directions for future research and practice will these challenges be successfully addressed.

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