



Open thinking in neurorehabilitation

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EDITORIAL

Open thinking in neurorehabilitation

Contributors to this issue highlight yet again the fundamental importance of key factors in neurorehabilitation – adopting a neurobiological perspective to better understand the true nature of impairment, accurate evaluation of function in order to best manage the problem and, above all, the involvement of the family to effect therapeutic change and long-term maintenance.

As Matta et al. report (*this issue*) visual and oculo-motor problems are not uncommon after neurological insult, but are not usually included in assessments of condition or rehabilitation need. Such disorders may be a relatively minor component in the overall presenting picture of disability but, as the findings of Matta et al. suggest, their remediation may have important consequences for a wide range of other functions, including learning, sleep, development and independence. Accurate and meaningful assessments form part of the “How” domain in rehabilitation [1] to provide essential information on function and treatment, to the benefit of the patient, family and therapist.

In their report of using modified constraint therapy, Wallen et al. (*this issue*) illustrate the further extension of established experimental procedures with demonstrated efficacy, to a clinical population in a daily setting. This area of rehabilitation illustrates the tremendous plastic properties of the nervous system after insult but, as the authors suggest, it is necessary to adapt therapeutic procedures to become user-friendly and family based-in order to achieve optimal outcomes. Making a child’s daily environments as therapeutic as possible requires the core involvement of the family.

Dorris et al. (*this issue*) review sleep problems in children with neurological disorders, another very common problem that can create enormous problems for the child and family, but yet which is seldom given adequate assessment or appropriate treatment. The authors illustrate the adverse effects of sleep disorders upon daytime functioning and development, including growth, learning, mood, memory, attention and intelligence. An unthinking



Figure 1. Auditorium dome of the new SARAH Hospital Rio de Janeiro; Architect João Filgueiras Lima (Lelé).

reaction of prescribing generic, off the shelf, behavioural or pharmacological solutions is inappropriate and unlikely to be effective. Successful treatment necessitates accurate assessment of the neurobiological bases of the problem, as well as the usual sleep habit evaluation.

Given the fundamental role of sleep, why is it such a neglected component in rehabilitation? Complaints of difficulties in sleep onset or maintenance, excessive fatigue, poor concentration and memory are common in clinical follow-up. There is abundant evidence on the crucial role of different stages of sleep in the development of various forms of memory and the adverse impact of sleep disturbance on memory. It is reasonable to suggest that achieving improved sleep after brain injury could effect more general beneficial changes in function and structure. Stickgold and Walter [2], for example, suggest that consolidation of memory allows greater automaticity in behaviour, shifting representations from declarative to procedural and reducing frontal demands, thereby increasing capacity, and the integration of old and new memories. As Dorris et al. conclude, this is an important area that is "... worthy of greater investment ...", but it would not be overstating the case to suggest that it should be an integral component of assessment for neurorehabilitation, another facet of the "How" approach [1].

The neurobiological bases of sleep, cognition and behaviour can be significantly affected by exercise, or its lack [3–6]. The health economics and benefits of exercise are in vogue again with the media and government, but to what effect in neurorehabilitation? Rimmer (*this issue*) indicates the critical need to provide access to appropriate services for this underserved population. In spite of the abundant evidence on the relationships between physical exercise and brain state in a variety of clinical neurological populations, this is yet another example of the failure of clinical practice to understand and implement established evidence from experimental neuroscience that could have profound benefits in cognition, behaviour and quality of life for the individual and family brain injury.

The critical importance of the family to rehabilitation is illustrated again and again in the literature (Dowda et al. [7]), including this journal (Johnson [8]; Whitt-Glover et al. [9]). If take-up of traditional therapy services is low (Kuhlthau et al. (*this issue*); Villela et al. (*this issue*)), then we should be questioning the appropriateness of those services. Taking the previous examples, should there be a greater focus on long-term provision of exercise in school and community [10], greater access to sports physiotherapists, and easier access to sleep clinics?

The challenge is to increase rehabilitation in community settings, using existing scientific

knowledge, which requires clinical rehabilitation professionals to start thinking outside the box.

For further reading, see [11–15].

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