A number of interesting issues relating to clinical practice and research were raised in this Conference. Central to the discussion was the need for physical therapists to be able to define the level of impairment in patients with traumatic head injuries (THI) in quantitative terms. To quantify contracture, for example, physical therapists need reliable measurement procedures for passive range of motion, procedures for which normative data have been published. Comparison of individual patient data with the normative databases would allow the physical therapist to establish the patient's variation from "normal" and target a specific outcome.

The reliability of measurements of passive range of motion is increased by standardizing the torque applied to the limb by the therapist. Simple and inexpensive devices, such as the spring balance attached to the aluminum-and-plastic footplate used in this study, can be used to quantify torque in the clinical setting. Torque-controlled measurement procedures are in common use by physical therapists in rehabilitation facilities throughout New South Wales, Australia, and are included in the undergraduate physical therapy curriculum at The University of Sydney, Australia.

Muscle biology literature (eg, Williams and Goldspink) and randomized controlled trials evaluating stretching (eg, Light et al) suggest that the critical stimulus required to increase passive range of motion is immobilization of muscle and other soft tissues in the lengthened position for extended periods of time. In people with contractures following THI, this stimulus can be achieved using a combination of serial casting, prolonged low-load stretches, and practice of motor tasks that place the muscles in the lengthened position. In clinical practice, physical therapists vary the dose (ie, the intensity, duration, and frequency) of each of these treatment strategies depending on the patient's motor problems. In my study, however, the effect of one dose of one treatment was evaluated (ie, 7 days of casting). The challenge for physical therapists is to establish the relative dose-response relationships of each treatment strategy so that we will be better able to tailor treatment programs to individual patients. Single-subject or group research designs could be used to achieve this purpose.

Several pertinent research questions were generated during the Conference. A series of studies are required to determine how factors such as contracture severity and the time postinjury influence the dose-response relationship of serial casting. Another avenue of research relates to the short-term and long-term effects of casting on the ability to perform everyday motor tasks (including standing up from a sitting position and walking). Conducting these types of research studies and communicating the results in peer-reviewed journals will contribute to the body of knowledge from which physical therapists can derive implications for treatment.

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References