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## Outcomes in spinal cord injury

Spinal cord injury remains a disorder without a sufficient remedy. Although both private and academic researchers continue to pursue therapies, proof of efficacy in improving neurological recovery remains elusive. One of the reasons for this difficulty may be our lack of sensitive outcome measures related to neurological and functional recovery after spinal cord injury. This issue of the *Journal of Rehabilitation Research and Development (JRRD)* includes eight of the original articles presented on outcome measures at the 31st Annual Meeting of the American Spinal Injury Association in Dallas, Texas, in May 2005. These articles include important additions to the literature on our strengths and weaknesses in documenting the neurological and functional effects of spinal cord injuries.

To date, the International Standards for Neurological Classification of Spinal Cord Injury, which document motor and sensory functions, and the Functional Independence Measure have been the primary neurological and functional outcomes used in spinal cord injury clinical trials. However, these outcome measures may not be sensitive enough to measure the changes obtained from new therapies. This deficiency may be the reason that, to date, no one has been able to document significant improvements from new therapies in neurological function after spinal cord injury. The goals of this meeting were therefore to discuss deficiencies in current measurement systems and describe some dynamic methods under development to remediate these weaknesses.

Articles in this issue include Marino's overview of domains of outcomes in spinal cord injury research (p. 113). This overview allows us to set the stage and build a framework for understanding the problem. Regarding specific recovery of motor function, Ellaway et al. (p. 69) describe the use of transcranial magnetic stimulation of the motor cortex to determine residual motor function around the level of injury. Next, Savic et al. (p. 77), focusing on the specific recovery of sensory function, describe the use of quantitative sensory testing to assess the sensory function of persons with spinal cord injuries more specifically than the International Standards for the Neurological Classification of Spinal Cord Injury. In regards to the recovery of function, Sisto and Dyson-Hudson (p. 123) discuss the use of dynamometry testing to assess motor function after spinal cord injury, while Catz and Itzkovich (p. 65) describe the Spinal Cord Independence Measure. In another article, Mulcahey et al. (p. 91) summarize tools used to assess the upper limb in tetraplegia and recommend development of further techniques that would be appropriate in clinical trials.

Finally, two articles address one of the significant weaknesses of the International Standards for the Neurological Classification of Spinal Cord Injury—the inability to document remaining autonomic functions. Krassioukov et al. (p. 103) discuss cardiovascular and sudomotor functioning and describe the

development of a standard means to document this function; Alexander et al. (p. 83) provide a similar proposal regarding sexual function.

Through the annual scientific meeting of the American Spinal Injury Association, the ongoing programming on the subject of spinal cord injury outcomes and research has continued to spark international interest in measurement in spinal cord injury and its impact on our ability to perform clinical trials. The articles in this issue of *JRRD* represent that effort. As a result, a third American Spinal Injury Association measurement meeting, "State of the Science in Spinal Cord Injury Measurement, Outcomes, and Research," will be held May 30, 2007, in Tampa, Florida. This meeting will include

a forum called SCOPE (Spinal Cord Outcomes Partnership Endeavor) in which participants discuss the possibility of an academic industry roundtable on spinal cord injury. For the reader who is particularly interested in this topic, we invite you to seek further information at <http://www.asia-spinalinjury.org/>. I hope this issue provides impetus for growth in 2007 and the future.

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