

Introduction: A Single-Topic Issue on Low Back Pain

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The papers in this issue of the *Journal* fall into three groups. The first group of three papers describes current research efforts to improve the delivery of care to persons with lower back pain (LBP). The next four papers focus on research efforts to develop improved procedures for assessing paraspinal muscle impairment. The remaining papers provide insight to utilizing biomechanical and electrokinesiological procedures for improving ergonomic and rehabilitative practice. As a whole, these papers provide research perspectives to LBP management from three separate, but complementary points of view: delivery of care, assessment of impairment, and understanding of spinal biomechanical function. The authors of these papers have followed the guidelines for this issue by describing their work in a comprehensive fashion and relating their results, whenever possible, to the impact they may have on rehabilitation practice.

While the prevalence of LBP has not changed over the past 20 years, the costs have increased exponentially and show no signs of abatement. LBP disorders comprise a major component of client care visits and have proven difficult to evaluate and treat. As a result, there is a growing interest to critically analyze the effectiveness of current conservative approaches to LBP management as well as to either develop new approaches, or at the least, document the scientific basis for existing ones. The first three papers address this movement in conservative back pain care from different perspectives. Harwood, Nordin, et al. describe the results of their efforts to implement a standardized LBP assessment procedure for industry-based physicians according to recent clinical practice guidelines set forth by the Agency for Health Care Policy and Research. The paper provides the first data we are aware of in which practical considerations for obtaining physician compliance to the new guidelines are documented. Also a product of the “new wave” of treatment approaches to LBP, the paper by Rainville et al. describes an aggressive, quota-based physical therapy program that is designed to decrease disability and associated pain behaviors and beliefs. Disability associated with chronic LBP accounts for a disproportionate amount of rehabilitation dollars. In spite of the fact that this segment of the LBP population is often the most frustrating and difficult to treat, compelling evidence is provided by these authors that a change in treatment philosophy away from managing pain symptoms may have widespread implications

toward reducing disability in this population. Although not a new therapy approach, chiropractic manipulation has gained renewed interest and acceptance by health care providers. Triano and colleagues provide a useful and much needed overview of this treatment approach in lumbar rehabilitation.

Clinicians are often frustrated by the uncertainty of knowing whether their treatments are targeting specific physical disorders or are only palliative. Furthermore, identification of measurable physical deficits in the vertebral spine complex has often eluded the capability of current clinical techniques. Therefore, studies are needed to develop exercise treatment regimens based upon well-documented muscle impairment assessment procedures. A number of different assessment approaches are currently in practice or under review or development. Because of the Guest Editor’s background and familiarity with surface electromyographic (EMG) approaches to paraspinal muscle assessment, we have focused this section of the issue on EMG techniques rather than attempting the impossible task of representing the variety of other techniques in use. The papers by Roy et al. and Oddsson et al. describe our research attempts to develop the necessary hardware, protocols, and parameters to characterize the muscular component of LBP impairment. Parallel studies by other researchers are described in papers contributed by Mannion et al. and by Moffroid. Their results provide compelling evidence for the importance of assessing paraspinal muscle fatigability and endurance capacity as a component to a comprehensive spinal assessment.

Muscle and soft tissue loading during purposeful tasks and movement has always been a major concern of LBP researchers and clinicians. Because there are no direct methods of measuring active muscle force or tissue load noninvasively, biomechanical simulations can provide an indirect means of predicting the consequences of such tasks. McGill has provided that rare paper, bridging the gap between biomechanical models of the spine and direct applications to daily and rehabilitative tasks. Clinicians should find this study of great practical value as well as pique their curiosity toward research efforts to characterize the functional components of the spine through theoretical formulations. Kalaf, Parnianpour, and colleagues have provided empirical data for optimization of muscle models that simulate dynamic tasks. Their measurement of dynamic trunk muscle force capacity

should be an improvement over static force measurements currently in use. The paper makes a strong case for this approach based in part on the requirements set forth by the Americans with Disability Act (ADA). The final paper by Wolf et al. provides empirical support for monitoring paraspinal muscle activity in combination with

trunk mobility during repetitive sagittal trunk movements. Reliability of performance indices has become a crucial topic of study in the research literature, and this paper emphasizes the importance of such efforts in developing objective functional assessment procedures.