

Rehabilitational Biomechanics research is aimed at contributing to the better understanding of the specific factors which are significant for the restoration and maintenance of human posture and mobility. Specifically, in cases when posture and mobility are impaired, it becomes important to quantify the impairment magnitude and determine what elements are critical to the existing deficiencies. As Lord Kelvin once said (1891) "When you can measure what you are speaking about and express it in numbers, you know something about it."

For this issue of Hot BAM on Rehabilitational Biomechanics, six papers were selected from the contributions to the *First Mediterranean Congress of Physical Medicine and Rehabilitation*, held in Herzliya, Israel, in May 1996. All selected papers present the results of systematic research on biomechanical aspects of human posture and mobility, with special reference to cases where pathological conditions already exist or are likely to develop.

The first two papers deal with dynamic balance in standing posture. This is a very relevant way of biomechanical evaluation of impairment, particularly in cases of severe gait dysfunction. Dvir et al. present a simple and practical method, by which balance reactions of chronic low back pain and control subjects can be compared, and conclude that frontal load carrying can aggravate the already impaired dynamic balance of chronic low back pain subjects. Isakov and Mizrahi discuss the importance of monitoring dynamic balance on both feet separately and present bilateral ground reaction force characteristics of hemiparetic, below-knee amputee and able-bodied populations.

The next two papers evaluate the feasibility of using quantitative EMG as an objective indicator of walking/running performance.

Esquenazi et al. examine this question in relation to the optimal alignment of a lower limb orthosis by setting optimization rules on the activity of the muscles, and comparing able-bodied and polio subjects. Mizrahi et al. present results on the aggravating effect of fatigue on shock loads on the human body in running, and conclude that quantitative EMG does not reflect the degree of fatigability.

The last two papers deal with mobility impairment due to spinal cord injury. Alfieri et al. concentrate on a novel classification of spasticity, as affected by electrical stimulation of the muscles. Ijzerman et al. study performance criteria of the reciprocating gait orthosis, often used by spinal cord injured subjects with or without functional electrical stimulation.

It is hoped that this collection of papers will provide an enjoyable sampler of the state-of-art of the Rehabilitational Biomechanics field.

Joseph Mizrahi
Department of Biomedical Engineering
Technion - Israel Institute of Technology
Haifa, Israel