

An Immediate Therapeutic Effect: Quantifying Changes in Locomotor Patterns Following a Single Pre-Surgical Intervention for Knee Ligament Insufficiency

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Abstract

Post-surgery advantage of pre-operative neuromuscular conditioning is sports medicine rehabilitation (the department paper). The aim of this study is to evaluate the immediate effect of a targeted pre-surgical physiotherapy session on the locomotor strategy of a person with a complete rupture of the anterior cruciate ligament. Using instrumented movement analysis (IMA), the three-dimensional joint kinematics of the right leg and the triaxial ground reaction forces (GRF) during walking on a treadmill. The results showed improved inter-limb symmetry significantly where there were more even patterns of mediolateral loading and less abnormal variability in load and knee joint angle during stance. The immediate, objective changes in movement that we observed imply that pre-surgical conditioning, even when brief, can acutely modify compensatory gait mechanics. This conditioning may prime the neuromuscular system for subsequent surgery and rehabilitation. Quantified evidence of the impact of exercise science principles on the acute-phase management of orthopedic injury is provided in the study.

