



VALIDATION OF FORCE PEDALS FOR BILATERAL STRENGTH ASYMMETRY TESTING

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Over 125,000 anterior cruciate ligament reconstruction surgeries are performed each year in the United States. Rates of re-injury to the reconstructed ACL or contralateral ACL up to 49% have been reported in certain populations. Altered biomechanics—including bilateral asymmetry in knee extensor strength—are known predictors of secondary injury. Indeed, ACL reconstruction patients have been reported to produce peak knee extensor moments 20% less in the operated limb as compared to the non-operated limb. Despite the prevalence of bilateral lower limb asymmetries, many physical therapists lack diagnostic capabilities due to the high costs of motion capture systems and force-measuring systems such as force plates or force pedals. The purpose of this study was to assess the validity and reliability of a newly released, cost effective commercial force-measuring pedal. Pedals were first tested under static conditions to identify accuracy of force measurements. Regression analyses indicated that measured and applied forces were essentially equal with a coefficient of determination of > 0.999 . Dynamic power output testing as compared to a validated power meter showed an average error of 1.19%. However, when used for biomechanical analysis the data displayed a variable delay of approximately two samples. The pedal was not found to be reliable for diagnostic use at this time, but further testing is underway to identify possible solutions to the sample delay.

