

FUNCTION AND STRENGTH OF PHYSICALLY ACTIVE INDIVIDUALS WITH A UNILATERAL, SINGLE-AXIS KNEE REPLACEMENT

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INTRODUCTION: Only recently could total knee replacement (TKR) individuals participate in many activities that place high stress on the knee region, e.g., golf. To enhance physical functioning, TKR components must be able to provide optimal leverage for the quadriceps to generate extensor torque, a-p stability when the cruciate ligaments are sacrificed, and varus-valgus stability via adequate medial and lateral collateral tension throughout the (Range of Motion) ROM. The use of a single flexion/extension (F/E) axis TKR design rather than a multiaxial TKR design has been theorized to accomplish these goals. Therefore, for this work in progress, it was of interest to determine for physically active individuals if the strength and function of the limb with a unilateral, single-axis TKR would be different to that of the intact limb.

METHOD: To date, 2 healthy individuals (56, 58 yr.) with ScorpioTM (Osteonics, Inc) TKR have participated. Physical and daily living activity status was obtained via a proprietary questionnaire, the Knee Society clinical rating system and the MOS SF-12 survey. The participants attended 3 sessions that also included knee ROM testing, function and balance tests performed on a force platform (NeuroCom), and isokinetic (60 deg/s) and isometric test quadriceps and hamstrings tests.

RESULTS: Selected results are shown in Table 1. Interlimb asymmetries were not consistent between the participants for the other variables. However, Knee F/E was approx. 10 deg. less on the TKR vs. the N-TKR side for both participants.

Table 1 Strength (Hams/Quads ratio) and Max. Force (%BW)

Variables.		Participant 1		Participant 2	
		TKR	N-TKR	TKR	N-TKR
H/Q ratio	Conc.	.48	.47	.64	.42
	Ecc.	.57	.61	.67	.40
Step Test (Max Force)	Propuls.	37	31	41	44
	Impact	40	31	40	34

DISCUSSION: After 2 yr. postop, participant 1 exhibited typical values for most tests, while participant 2 still has quadriceps weakness in the TKR limb that also affected his function during stepping and the other function/balance tests. Slight reduction in sport performance was also noted by both PPs.