

## Supplementary Table 1

*Strength Exercise Intensity Compared with Return to Sport Outcome Measures*

Study	Time Post-Op/RT Intensities & Graft Type	Strength LSI <sup>a</sup>			Hop Tests LSI <sup>a</sup>			
		Quadriceps	Hamstrings	Other	SH	TH	TCH	Other
Berschin et al., 2014 [28]	Weeks 2-5: 50-60% 1RM	Isometric - 70%	Isometric - 75%	-	-	-	-	-
	Weeks 6-11: 60-80% 1RM	60 <sup>os.-1</sup> - 62%	60 <sup>os.-1</sup> - 72%					
	Graft: PT							
Bieler et al., 2014 [29]	HI group	-	-	Quadriceps	HI	HI	-	-
	Weeks 8-9: 20RM			Power:	69%	75%		
	Weeks 10 & 11: 15RM			HI	LI	LI		
	Weeks 12-13: 12RM			97.5%	65%	68%		
	Weeks 14-20: 8RM			LI				
	LI group			83.5%				
	Graft: PT & HT							
Friedmann-Bette et al., 2018 [36]	Weeks 12-24: 8RM	CON/ECC	-	-	-	-	-	-
	Graft: QT & HT	60 <sup>os.-1</sup> - 80% 180 <sup>os.-1</sup> - 82% CON/ECC+ 60 <sup>os.-1</sup> - 78% 180 <sup>os.-1</sup> - 82%						
Fukuda et al., 2013 [27]	Weeks 1/2-26/27: 10RM & 70% 1RM	EOKC	EOKC	-	EOKC	-	EOKC	-
		94.1%	84.5%		92.3%		94%	
		LOKC	LOKC		LOKC		LOKC	
	Graft: HT	89.5%	87.4%		94.9%		92.5%	

Study	Time post-op/RT Intensities & Graft Type	Strength LSI <sup>a</sup>			Hop Tests LSI <sup>a</sup>			
		Quadriceps	Hamstrings	Other	SH	TH	TCH	Other
Kang et al., 2012 [32]	Weeks 12-24: 70% 1RM	OKC (lb-ft) 60 <sup>os-1</sup> - 118 (65% ↑) 180 <sup>os-1</sup> - 80.4 (71%↑)	OKC (lb-ft) 60 <sup>os-1</sup> - 69.5 (94% ↑) 180 <sup>os-1</sup> - 64.9 (45%↑)	Squat (kg): OKC 164.7 (17% ↑)	-	-	-	-
	Graft: not disclosed	CKC (lb-ft) 60 <sup>os-1</sup> - 98.1 (21% ↑) 180 <sup>os-1</sup> - 51.2 (160%↑)	CKC (lb-ft) 60 <sup>os-1</sup> - 55.6 (80% ↑) 180 <sup>os-1</sup> - 40.8 (237%↑)	Endurance (lb-ft): OKC Ext 80.4 (71%↑) Flx 51.2 (65%↑) CKC Ext 64.9 (45%↑) Flx 40.8 (237%↑)				
Kiniliki et al., 2014 [33]	Weeks 3-15: 5-50% 1RM	Early Onset (Nm/kg) 60 <sup>os-1</sup> - 68.8 (14%↑) 180 <sup>os-1</sup> - 77.6 (32%↑)	Early Onset (Nm/kg) 60 <sup>os-1</sup> - 97 (10%↑) 180 <sup>os-1</sup> - 103.9 (25%↑)	-	Early Onset 91.1%	-	-	Vertical Hop: Early Onset 89.2%
	Graft: HT	Standard (Nm/kg) 60 <sup>os-1</sup> - 69.5 (8%↑) 180 <sup>os-1</sup> - 63.5 (13%↑)	Standard (Nm/kg) 60 <sup>os-1</sup> - 81.2 (9%↑) 180 <sup>os-1</sup> - 86.3 (18%↑)		Standard 84.6%			Early Onset 77.3%
Lepley et al., 2015 [34]	Weeks 6-12: 60% 1RM	ECC 2.1 Nm/kg	-	-	-	-	-	-
	Graft: PT & HT	NMES + ECC 1.7 Nm/kg NMES 1.7 Nm/kg Standard 1.5 Nm/kg						
Perry et al., 2005 [30]	Weeks 8-10: 20RM	-	-	-	OKC 77%	-	OKC 79%	Vertical Hop: OKC
	Weeks 11-13: 6RM				CKC 74%		CKC 81%	OKC 75%
	Graft: PT and HT							CKC 78%

Study	Time post-op/RT Intensities & Graft Type	Strength LSI <sup>a</sup>			Hop Tests LSI <sup>a</sup>			
		Quadriceps	Hamstrings	Other	SH	TH	TCH	Other
Risberg et al., 2007 [31]	Weeks 2-27: 50-80% 1RM (phase 3), 3 x 6 Reps (phase 4) <sup>b</sup>  Graft: PT	ST	ST	-	ST	ST	-	Stairs Hop:
		60 <sup>os.-1</sup> – 67.3%	60 <sup>os.-1</sup> – 88.3%		81%	83.1%		ST
		240 <sup>os.-1</sup> – 78%	240 <sup>os.-1</sup> – 94.7%		NT	NT		79.8%
		NT	NT		84.9%	88.5%		NT
		60 <sup>os.-1</sup> – 79.1%	60 <sup>os.-1</sup> – 86.3%					79.8%
	240 <sup>os.-1</sup> – 79%	240 <sup>os.-1</sup> – 90.8%						
Santos et al., 2018 [37]	2-5 years, 12 weeks: 10RM  Graft: PT	Isometric - 94% <sup>c</sup>	Isometric - 107% <sup>c</sup>	-	93%	94%	102%	Figure-8
		Con30 <sup>os.-1</sup> - 89% <sup>c</sup>	Con30 <sup>os.-1</sup> - 105% <sup>c</sup>					Hop:
		Con120 <sup>os.-1</sup> - 93% <sup>c</sup>	Con120 <sup>os.-1</sup> - 110% <sup>c</sup>					101%
		Ecc30 <sup>os.-1</sup> - 111% <sup>c</sup>	Ecc30 <sup>os.-1</sup> - 128% <sup>c</sup>					
		Ecc120 <sup>os.-1</sup> - 104% <sup>c</sup>	Ecc120 <sup>os.-1</sup> - 125% <sup>c</sup>					
Welling et al., 2019 [35]	Weeks 2-16: <50% 1RM Weeks 17-31: 60-80% 1RM Weeks 32-48: >80% 1RM <sup>d</sup>  Graft: PT & HT	3.9mo post-op: 72%	3.9mo post-op: 89.3%	Quads PT/BW	-	-	-	-
		6.6mo post-op: 84.7%	6.6mo post-op: 96.6%	3.9mo post-op: 2.4				
		9.7mo post-op: 94.1%	9.7mo post-op: 97.9%	6.6mo post-op: 2.9				
				9.7mo post-op: 3.2				

<sup>a</sup> LSI unless unit otherwise specified

<sup>b</sup> not specified if 6RM

<sup>c</sup> LSI comparison between pre-intervention non-injured leg and post-intervention injured leg

<sup>d</sup> Approximate weeks stated. Progression through stages of training varied depending on the individual (up to 4 weeks)

*Note:* In studies where only the raw data for return to sport outcome measures were reported, LSI's were calculated where possible; otherwise, percentage increases have been provided.

Abbreviations: PT, patellar tendon; <sup>os.-1</sup>, degrees per second; %, per cent; +, and; HI, high intensity; LI, low intensity; HT, hamstring tendon; QT, quadriceps tendon; CON, concentric; ECC, eccentric; ECC+, eccentric overload; EOKC/LOKC, early/late start open kinetic chain; OKC, open kinetic chain; CKC, closed kinetic chain; kg, kilograms; Ext, Extension; Flx, Flexion; ST, strength training; lb-ft, pounds per feet; mo, months, NM/kg, newton-meters per kilogram; NT, neuromuscular training; ↑, increased/improved; N, neuromuscular electrical stimulation; post-op, post-operative; Quads PT/BW, quadriceps peak torque normalised to bodyweight; RM, repetition maximum; SH, single-hop; TH, triple hop; TCH, triple crossover hop