

Supplementary File 1: Sensitivity Analysis Results Table 3 and 4:**SF1. Table 3.** Functional performance at 1-year and risk of worsening early osteoarthritis features up to 5-years[~]

		Worsening early osteoarthritis features on MRI [^]				
		PF Cartilage	PF BML	TF Cartilage	TF BML	TF Meniscal
		<i>n=136/312(44%)</i>	<i>n=56/780 (18%)</i>	<i>n=160/780 (21%)</i>	<i>n=120/780 (15%)</i>	<i>n=102/468 (22%)</i>
Functional Battery (ref ≥90% LSI all tests; n=13(18%))	n (%) meeting criteria	Ref ≥90%LSI all 4	Ref ≥90%LSI all 4	Ref ≥90%LSI all 4	Ref ≥90%LSI all 4	Ref ≥90%LSI all 4
Poor function any 3 tests*	13(18%)	1.37 (0.34, 5.51)	3.95 (1.02, 15.36)	0.85 (0.16, 4.61)	1.56 (0.16, 14.62)	1.77 (0.41, 7.59)
Poor function any 2 tests*	19(26%)	1.70 (0.53, 5.45)	1.44 (0.23, 9.03)	2.84 (0.92, 8.74)	1.10 (0.10, 11.74)	1.24 (0.28, 5.40)
Poor function any 1 test*	19(26%)	1.18 (0.32, 4.31)	0.31 (0.03, 3.26)	3.41 (0.78, 14.86)	2.83 (0.20, 40.15)	1.11 (0.26, 4.83)
Poor function ≥ 3 tests*	60(83%)	1.40 (0.74, 2.66)	5.65 (1.87, 16.99)	0.42 (0.12, 1.54)	1.03 (0.30, 3.52)	1.49 (0.53, 4.12)
Poor function ≥ 2 tests*	41(56%)	1.49 (0.77, 2.90)	6.92 (1.87, 21.22)	1.04 (0.22, 4.91)	0.64 (0.23, 1.78)	1.41 (0.52, 3.82)
Poor function ≥ 1 test*	22(30%)	1.21 (0.58, 2.56)	2.24 (0.56, 8.98)	1.52 (0.54, 4.26)	0.72 (0.15, 3.49)	1.23 (0.42, 3.66)

[~]Values are risk ratios (95% confidence intervals). Analysis performed in n=73, as 5 participants were not included, as they could not perform a valid test on both ACLR and contralateral limb for the one-leg rise.

[^]A risk ratio >1 represents a greater risk of the MRI-OA feature worsening in the presence of poor functional performance. For example, individuals with <90% LSI on the one-leg-rise were 3.67 times more likely to have worsening patellofemoral BMLs, than those with >90% LSI. **Bold** values indicate a statistically significant association (p<0.05)

*Poor functional performance was defined as <90% LSI

LSI = limb symmetry index; BML = bone marrow lesion

SF1. Table 4. Functional performance at 1-year post-ACLR: relationship with change in KOOS and IKDC between 1- and 5-years[~]

		Change in KOOS and IKDC between 1- and 5-years [^]				
		KOOS-Symptoms	KOOS-Pain	KOOS-Sport	KOOS-QoL	IKDC
Functional Battery	n (%) meeting criteria					
(ref ≥90% LSI all tests; n=14(18%))						
Poor function all 4 tests*	10(13%)	2.94 (-8.83, 14.72)	-1.11 (-7.33, 5.11)	5.53 (-9.27, 20.33)	4.78 (-7.68, 17.25)	3.19 (-4.68, 11.07)
Poor function any 3 tests*	14(18%)	8.27 (-2.72, 19.27)	1.71 (-4.01, 7.45)	3.24 (-8.62, 15.10)	1.97 (-9.09, 13.04)	1.12 (-5.82, 8.06)
Poor function any 2 tests*	20(27%)	10.45 (0.31, 20.59)	4.01 (-1.27, 9.30)	7.49 (-3.49, 18.48)	11.75 (1.79, 21.70)	8.79 (2.50, 15.07)
Poor function any 1 test*	18(24%)	0.52 (-9.35, 10.41)	1.19 (4.01, 6.38)	4.34 (-6.43, 15.12)	1.72 (-8.18, 11.63)	0.46 (-5.73, 6.67)
Poor function ≥ 3 tests*	24 (32%)	0.87 (-6.74, 8.50)	-1.63 (-5.44, 2.27)	-0.64 (-8.96, 7.68)	-2.84 (-10.77, 5.07)	-2.43 (-7.53, 2.68)
Poor function ≥ 2 tests*	44 (58%)	7.89 (0.60, 15.18)	1.64 (-2.15, 5.44)	3.46 (-4.45, 11.36)	6.78 (-0.42, 13.97)	5.34 (0.67, 10.02)
Poor function ≥ 1 test*	62 (82%)	5.04 (-3.36, 13.44)	1.72 (-2.63, 6.08)	5.06 (-3.87, 13.98)	5.20 (-3.40, 13.79)	3.30 (-2.20, 8.85)

[^]Values are beta co-efficient (95% confidence intervals). Analysis performed in n=76, as 5 participants were not included, as they could not perform a valid test on both ACLR and contralateral limb for the one-leg rise.

* Poor functional performance was defined as <90% LSI

[^]The beta coefficient represents the adjusted difference in KOOS or IKDC in the presence of the dichotomous exposure variables (i.e. poor function defined as <90% LSI). For example, those with <90% LSI had on average 7.89 points greater improvement on the KOOS-QoL than those with >90%. **Bold** values indicate a statistically significant association (p<0.05)

LSI=limb symmetry index; KOOS=Knee injury and Osteoarthritis Outcome Score; QoL= Quality of Life; IKDC= International Knee Documentation Committee subjective knee evaluation.