Supplemental Figures and Tables

Table S1: Coefficient of determination (R^2) and the slope of the least-squares linear regression model (β) for each of the ACL reconstruction surgical factors that had the greatest effect on knee mechanics during walking. Units for the slope of each linear regression model are the ACL metric divided by the knee mechanics metric.

	Graft Sagittal Plane Angle (deg)		A-P Location of Tibial Tunnel (mm)		A-P Location of Femoral Tunnel (mm)		Graft Stiffness (N/mm)		Graft Initial Tension (N)	
	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β
Anterior Tibial Translation (mm)	0.22	0.057	0.28	-0.20	—	—	0.089	-0.024	0.48	-0.0026
Peak ACL Load (N)	0.047	0.81	—	—	0.22	5.5	0.19	0.80	0.59	0.12
Maximum Pressure on Medial Plateau (MPa)	0.28	0.023	0.25	-0.066	—	—	0.056	-0.0007	0.40	-0.0075
Maximum Pressure on Lateral Plateau (MPa)	0.23	0.0036	0.28	0.012	—	—	0.23	0.00079	0.56	0.0048
Anterior Location of COP on Medial Plateau (mm)	0.23	-0.049	0.27	0.16	—	—	0.083	0.0021	0.50	0.02
Anterior Location of COP on Lateral Plateau (mm)	0.20	-0.037	0.30	-0.14	—	—	0.10	0.0018	0.47	0.016

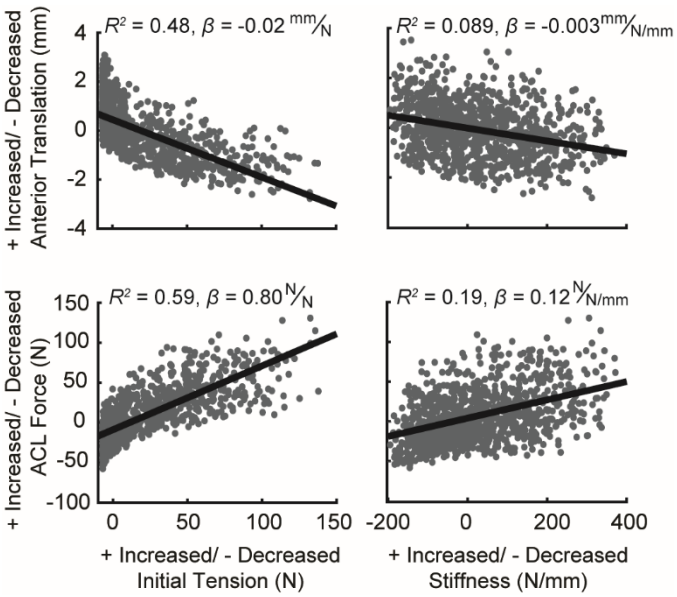

Figure S1: Scatter plots demonstrate the effect of simulated changes in ACL graft initial tension and graft stiffness on anterior tibial translation and ACL force at the instance of peak ACL force during stance for the virtual ACLR models. Each point in the scatter plots was computed relative to the native model (virtual ACLR model minus native). Positive values indicate that the virtual ACLR model value was greater than that of the nominal model, and negative values indicate that the ACLR model value was less than that of the nominal model. Scatter plots include coefficient of determination (R^2) and the slope of the least-squares linear regression (β) computed between the ACL reconstruction surgical factors and the knee mechanics metrics.

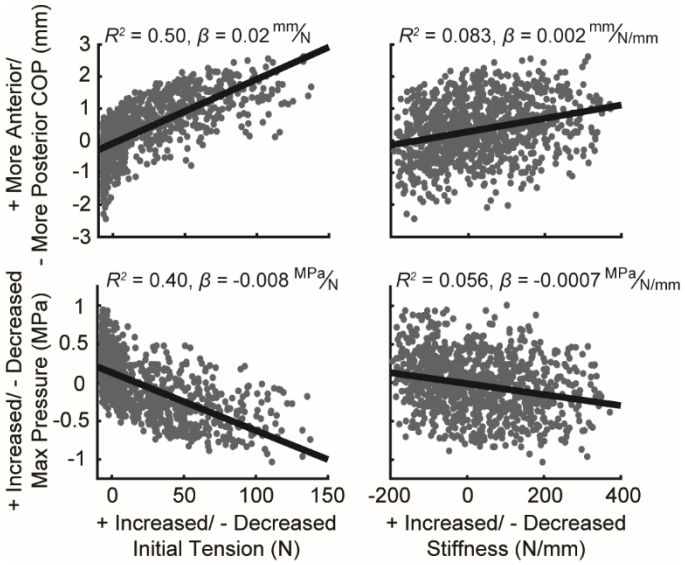

Figure S2: Scatter plots demonstrate the effect of simulated changes in ACL graft initial tension and graft stiffness on anterior COP location and maximum pressure on the medial tibial plateau at the instance of peak ACL force during stance. Each point in the scatter plots was computed relative to the native model (virtual ACLR model minus native). Positive values indicate that the virtual ACLR model value was greater than that of the nominal model, and negative values indicate that the ACLR model value was less than that of the nominal model. Scatter plots include coefficient of determination (R^2) and the slope of the least-squares linear regression (β) computed between the ACL reconstruction surgical factors and the knee mechanics metrics.