

Article

# Comparison of Standard Clinical and Instrumented Physical Performance Tests in Discriminating Functional Status of High-Functioning People Aged 61–70 Years Old

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**Table S1.** Collinearity analysis of the 30CST instrumented physical performance measures.

	First step		Last step	
	VIF	detection	VIF	detection
Mean Sit-to-Stand RMS A AP	5.79	0	3.30	0
Mean Sit-to-Stand RMS A ML	6.01	0	2.91	0
Mean Sit-to-Stand RMS A V	4.68	0	2.45	0
Mean Sit-to-Stand NJS A AP	20.26	1	6.06	0
Mean Sit-to-Stand NJS A ML	18.54	1	-	-
Mean Sit-to-Stand NJS A V	17.02	1	-	-
Mean Sit-to-Stand RMS G AP	3.28	0	2.85	0
Mean Sit-to-Stand RMS G ML	4.27	0	3.88	0
Mean Stand-to-Sit RMS A AP	7.51	0	2.78	0
Mean Stand-to-Sit RMS A ML	7.31	0	3.16	0
Mean Stand-to-Sit RMS A V	4.14	0	2.09	0
Mean Stand-to-Sit NJS A AP	29.03	1	2.44	0
Mean Stand-to-Sit NJS A ML	27.97	1	-	-
Mean Stand-to-Sit NJS A V	19.68	1	-	-
Mean Stand-to-Sit RMS G AP	4.38	0	3.73	0
Mean Stand-to-Sit RMS G ML	5.34	0	3.86	0
Mean Duration Sit-to-Stand	11.18	1	4.84	0
SD Duration Sit-to-Stand	5.70	0	5.27	0
Mean Duration Stand-to-Sit	17.27	1	-	-
SD Duration Stand-to-Sit	4.26	0	3.77	0
Instrumented number of repetitions	24.75	1	-	-

ACRONYMS: A: Accelerometer; AP: Antero-Posterior; G=Gyroscope; ML: Medio-Lateral; RMS: Root Mean Square; SD: Standard Deviation; NJS: Normalized Jerk Score; V: Vertical; VIF: Variance Inflation Factor

**Table S2.** Univariable and multivariable analysis of the 30CST instrumented physical performance measures.

	Univariable logistic regression			Stepwise backward multivariable logistic regression		
	OR	95% CI	p-value	OR	95% CI	p-value
Mean Sit-to-Stand RMS A AP	1.04	[0.76-1.41]	0.820			
Mean Sit-to-Stand RMS A ML	1.22	[0.89-1.68]	0.224			
Mean Sit-to-Stand RMS A V	1.12	[0.82-1.53]	0.473			
Mean Sit-to-Stand NJS A AP <sup>1</sup>	0.80	[0.58-1.09]	0.157			
Mean Sit-to-Stand RMS G AP	1.01	[0.74-1.38]	0.928			
Mean Sit-to-Stand RMS G ML	1.14	[0.83-1.56]	0.413			
Mean Stand-to-Sit RMS A AP	1.03	[0.76-1.40]	0.852			
Mean Stand-to-Sit RMS A ML	1.14	[0.83-1.56]	0.415			
Mean Stand-to-Sit RMS A V	1.12	[0.82-1.53]	0.487			
Mean Stand-to-Sit NJS A AP <sup>1</sup>	0.67	[0.49-0.94]	<b>0.019</b>			
Mean Stand-to-Sit RMS G AP	0.90	[0.66-1.23]	0.503			
Mean Stand-to-Sit RMS G ML	0.78	[0.57-1.08]	<b>0.131</b>	0.71	[0.49 0.98]	<b>0.045</b>
Mean Duration Sit-to-Stand	0.59	[0.41-0.84]	<b>0.004</b>	0.69	[0.48 0.98]	<b>0.041</b>
SD Duration Sit-to-Stand	0.65	[0.47-0.92]	<b>0.014</b>	0.62	[0.41 0.89]	<b>0.014</b>
SD Duration Stand-to-Sit	0.82	[0.60-1.13]	0.226			

Bolded p-values indicate statistically significant univariable and multivariable discriminative ability ( $\leq 0.15$  and  $\leq 0.05$  respectively).

ACRONYMS: A: accelerometer; AP: Antero-Posterior; G: gyroscope; NJS: Normalized Jerk Score; ML: Medio-Lateral; RMS: Root Mean Square; SD: Standard Deviation; V: Vertical. <sup>1</sup>log transformed feature

**Table S3.** Collinearity analysis of the TUG instrumented physical performance measures.

	First step		Last step	
	VIF	detection	VIF	detection
Sit-to-Walk Duration	11.44	1	6.20	0
180Turn Duration	12.11	1	6.90	0
Turn-to-Sit Turning Duration	9.43	0	9.35	0
Turn-to-Sit Duration	37.85	1	9.36	0
Walk Duration	79.06	1	7.67	0
Sit-to-Walk RMS A AP	2.91	0	2.90	0
Sit-to-Walk RMS A ML	2.91	0	2.83	0
Sit-to-Walk RMS A V	18.24	1	2.31	0
Sit-to-Walk NJS A AP	10.17	1	9.97	0
Sit-to-Walk NJS A ML	8.11	0	8.02	0
Sit-to-Walk NJS A V	7.58	0	6.75	0
Turn-to-Sit RMS A AP	2.77	0	2.36	0
Turn-to-Sit RMS A ML	4.54	0	2.98	0
Turn-to-Sit RMS A V	24.83	1	-	-
Turn-to-Sit NJS A AP	10.57	1	9.08	0
Turn-to-Sit NJS A ML	12.85	1	-	-
Turn-to-Sit NJS A V	8.31	0	6.43	0
180Turn Mean Velocity	8.65	0	8.23	0
Turn-to-Sit Turning Mean Velocity	9.82	0	9.70	0
180Turn Maximum Velocity	3.74	0	3.41	0
Turn-to-Sit Turning Maximum Velocity	6.01	0	5.97	0
180Turn NJS G V	3.58	0	3.39	0
Turn-to-Sit Turning NJS G V	4.39	0	4.34	0
Walk RMS A AP	3.66	0	3.11	0
Walk RMS A ML	2.71	0	2.52	0
Walk RMS A V	18.69	1	-	-
180Turn Number of Steps	2.46	0	2.41	0
Walk Number of Steps	6.88	0	6.43	0
Instrumented TUG total duration	132.41	1	-	-

ACRONYMS: A: Accelerometer; AP: Antero-Posterior; G= Gyroscope; ML: Medio-Lateral; NJS: Normalized Jerk Score; RMS: Root Mean Square; SD: Standard Deviation; V: Vertical; VIF: Variance Inflation Factor

**Table S4.** Univariable and multivariable analysis of the TUG instrumented physical performance measures.

	Univariable			Stepwise backward multivariable logistic regression		
	OR	95% CI	p-value	OR	95% CI	p-value
Sit-to-Walk Duration	0.96	[0.70-1.31]	0.786			
180Turn Duration	0.80	[0.58-1.11]	0.185			
Turn-to-Sit Turning Duration	0.62	[0.44-0.88]	<b>0.008</b>			
Turn-to-Sit Duration	0.70	[0.50-0.97]	<b>0.032</b>			
Walk Duration	0.54	[0.36-0.79]	<b>0.002</b>	0.59	[0.38-0.86]	<b>0.010</b>
Sit-to-Walk RMS A AP	1.20	[0.87-1.65]	0.258			
Sit-to-Walk RMS A ML	1.04	[0.76-1.43]	0.787			
Sit-to-Walk RMS A V	1.89	[0.69-5.18]	0.213			
Sit-to-Walk NJS A AP <sup>1</sup>	1.18	[0.86-1.63]	0.303			
Sit-to-Walk NJS A ML <sup>1</sup>	1.16	[0.84-1.60]	0.364			
Sit-to-Walk NJS A V <sup>1</sup>	1.28	[0.90-1.82]	0.173			
Turn-to-Sit RMS A AP	0.96	[0.71-1.31]	0.805			
Turn-to-Sit RMS A ML	1.25	[0.91-1.72]	0.164			
Turn-to-Sit NJS A AP <sup>1</sup>	0.94	[0.69-1.28]	0.703			
Turn-to-Sit NJS A V <sup>1</sup>	0.82	[0.60-1.13]	0.223			
180Turn Mean Velocity	1.18	[0.86-1.62]	0.301			
Turn-to-Sit Turning Mean Velocity	1.60	[1.14-2.25]	<b>0.007</b>			
180Turn Maximum Velocity	1.38	[1.00-1.91]	<b>0.051</b>			
Turn-to-Sit Turning Maximum Velocity	1.66	[1.17-2.35]	<b>0.004</b>	1.50	[1.05-2.18]	<b>0.031</b>
180Turn NJS G V <sup>1</sup>	0.87	[0.63-1.19]	0.386			
Turn-to-Sit Turning NJS G V <sup>1</sup>	0.76	[0.55-1.06]	<b>0.104</b>			
Walk RMS A AP	1.35	[0.95-1.92]	<b>0.098</b>			
Walk RMS A ML	1.26	[0.92-1.74]	0.155			
180Turn Number of Steps	0.95	[0.70-1.31]	0.764			
Walk Number of Steps	0.58	[0.40-0.85]	<b>0.005</b>			

Bolded p-values indicate statistically significant univariable and multivariable discriminative ability ( $\leq 0.15$  and  $\leq 0.05$  respectively).

ACRONYMS: A: accelerometer; AP: Antero-Posterior; G: gyroscope; ML: Medio-Lateral; NJS: Normalized Angular Jerk Score; RMS: Root mean square; V: Vertical; <sup>1</sup>log transformed feature.

**Table S5.** Bootstrapping validation of the 30CST and TUG models.

	30CST		TUG	
	AUC original	AUC corrected	AUC original	AUC corrected
Standard clinical	0.682	0.684	0.684	0.685
Instrumented	0.680	0.654	0.650	0.627
Combined	0.661	0.630	0.684	0.670