CORRECTION

Correction to: A suite of automated tools to quantify hand and wrist motor function after cervical spinal cord injury

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Correction to: J NeuroEng Rehabil (2019) 16:48 https://doi.org/10.1186/s12984-019-0518-8

The original article [1] contains several errors which the authors would like to rectify:

- 1) Figs 3B & 3C contain duplicate data from Fig. 5. The correct version of Fig. 3 can be viewed ahead.
- 2) The Authors' contributions section contains a minor typo and should instead read as the following:

"KMG, SAH, JW, MPK and RLR contributed to experimental design. KMG and SAH wrote the manuscript. KMG and RLR provided engineering. KMG, KR, VW and EG conducted data collection. SAH, MPK, and RLR provided funding. All authors read and approved the final manuscript."

3) Tables 2 & 3 contain minor formatting errors. The correct presentation of both tables can be viewed ahead.

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The original article can be found online at https://doi.org/10.1186/s12984-019-0518-8

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Published online: 07 January 2020

Reference

1. Grasse KM, Hays SA, Rahebi KC, Warren VS, Garcia EA, Wiggington JG, et al. A suite of automated tools to quantify hand and wrist motor function after cervical spinal cord injury. J NeuroEng Rehabil. 2019;16:48. https://doi.org/ 10.1186/s12984-019-0518-8.







direction of movement. **e** Example of single flexion and extension ROM trials performed by uninjured and cSCI participants. **f** Wrist flexion and extension ROM is significantly reduced in cSCI participants compared to uninjured participants. Individual data is depicted with open circles. Error bars indicate SD. Significant differences were determined by Wilcoxon rank sum tests and are noted as *p < 0.05, **p < 0.01, ***p < 0.01

		Peak			CV		
		UI	cSCI		UI	cSCI	
Measure	Task (units)	Mean (SD)	Mean (SD)	<i>p</i> -val	Mean (SD)	Mean (SD)	<i>p</i> -val
Force	Finger Flexion $(N)^{\dagger}$	78.3 (22.7)	2.94 (2.49)	< 0.001	6.8 (2.3)	40.1 (25.3)	< 0.001
	Finger Extension (N) ⁺	17.3 (5.42)	1.23 (1.99)	< 0.001	12.7 (5.2)	71.1 (34.6)	< 0.001
	Wrist Flexion (Nm)	5.41 (2.46)	0.89 (0.75)	< 0.001	14.7 (4.0)	27.4 (18.2)	0.009
	Wrist Extension (Nm)	3.24 (1.29)	1.27 (0.98)	< 0.001	12.4 (4.6)	25.7 (12.8)	0.002
	Handle Pronation (Nm)	6.36 (2.37)	1.76 (1.36)	< 0.001	8.3 (2.9)	31.4 (33.2)	0.015
	Handle Supination (Nm)	4.58 (1.71)	1.10 (0.67)	< 0.001	8.0 (3.5)	21.0 (16.5)	0.013
	Doorknob Pronation (Nm)	3.63 (1.14)	0.30 (0.28)	< 0.001	10.3 (3.6)	60.7 (44.9)	< 0.001
	Doorknob Supination (Nm)	3.51 (1.40)	0.38 (0.32)	< 0.001	11.6 (5.9)	28.6 (13.3)	< 0.001
Range of Motion	Wrist Flexion (°)	81.3 (5.56)	56.5 (26.7)	0.027	4.0 (2.7)	8.4 (7.8)	0.11
	Wrist Extension (°)	71.9 (8.36)	48.5 (20.9)	0.002	2.7 (1.3)	7.6 (7.1)	0.026
	Handle Pronation (°)	104.1 (12.6)	95.9 (36.9)	0.92	4.5 (2.4)	6.5 (4.4)	0.87
	Handle Supination (°)	74.0 (14.5)	56.8 (24.2)	0.051	5.3 (1.6)	4.3 (2.4)	0.31
	Doorknob Pronation (°)	107.1 (20.9)	94.7 (41.5)	0.72	4.4 (2.4)	21.7 (36.7)	0.12
	Doorknob Supination (°)	72.1 (19.8)	56.7 (35.1)	0.25	5.4 (2.4)	36.8 (69.7)	0.13

Table 2 Novel system measurement results	by participant g	group (N = 13). CV, coefficient of	variation; †Values based on $n = 12$
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Table 3 Test-retest reproducibility results of the novel metrics for cSCI participants (N = 10). MDD, minir	nally detectable difference;
SD ₂₀ , standard deviation of 20 trials; ICC, intraclass correlation coefficient; [†] Values based on $n = 9$	

Measure	Task (units)	Change (SD)	<i>p</i> -val	MDD	1.96*SD ₂₀	ICC
	Composite Score	0.03 (0.06)	0.72	0.107	-	0.95
Force	Finger Flexion (N) †	0.21 (3.42)	0.88	5.99	2.52	0.40
	Finger Extension $(N)^{\dagger}$	-0.08 (1.99)	0.94	3.48	1.29	0.63
	Wrist Flexion (Nm)	0.65 (1.99)	0.45	3.70	0.96	0.45
	Wrist Extension (Nm)	0.34 (0.63)	0.55	1.17	0.68	0.85
	Handle Pronation (Nm)	0.13 (1.37)	0.88	2.55	1.10	0.75
	Handle Supination (Nm)	0.16 (0.16)	0.75	1.79	0.76	0.62
	Doorknob Pronation (Nm)	0.005 (0.16)	0.97	0.30	0.28	0.90
	Doorknob Supination (Nm)	-0.05 (0.22)	0.65	0.41	0.24	0.67
Range of Motion	Wrist Flexion (°)	1.52 (10.8)	0.90	20.1	10.8	0.93
	Wrist Extension (°)	4.46 (6.4)	0.67	11.9	8.3	0.95
	Handle Pronation (°)	3.49 (18.7)	0.84	34.7	15.5	0.88
	Handle Supination (°)	0.07 (7.6)	0.99	14.0	7.4	0.96
	Doorknob Pronation (°)	5.29 (20.8)	0.76	38.7	22.1	0.86
	Doorknob Supination (°)	0.03 (9.4)	0.99	17.5	14.9	0.93