Supplemental Material

Table S1. Search strategy for MEDLINE Complete.

S1	Stroke OR cerebrovasc* OR CVA OR hemipl* OR hemipar* [human][all adult: 19+ years]
S2	"Lower extremit*" OR "leg*" OR leg OR thigh OR hip OR knee OR ankle OR foot OR toe [human][all adult: 19+ years]
S3	Sensation OR sensory OR tactile OR somatosens* OR propriocepti* OR kin*sthesi* OR touch OR "position sense" OR discriminati* OR stereognosis OR vibrat* [human][all adult: 19+ years]
S4	Retraining OR training OR education OR rehabilitation OR stimulation [human][all adult: 19+ years]
S5	S1 AND S2 AND S3 AND S4

CVA – cerebrovascular accident; S – search.

Table S2. Quality appraisal summary.

Study	Selection Bias	Study Design	Confounders	Blinding	Data Collection Methods	Withdrawals & Dropouts	Global Rating
Aruin 2012[46]	Moderate	Strong	Weak	Weak	Strong	Strong	Weak
Cordo 2009[39]	Weak	Weak	NA	Weak	Strong (gait); Weak (sensory)	Strong	Weak
Da Silva Ribeiro 2015[51]	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
Han 2013[40]	Weak	Strong	Strong	Weak	Strong	Strong	Weak
Hillier 2006[23]	Weak	Moderate	Weak	Moderate	Strong (balance); Weak (sensory)	Strong	Weak
Huzmeli 2017[41]	Weak	Strong	Strong	Weak	Strong (balance); Weak (sensory)	Moderate	Weak
Kwon 2013[52]	Weak	Strong	Strong	Weak	Strong	NA	Weak
Lee 2015[42]	Weak	Strong	Strong	Weak	Strong	Strong	Weak
Lynch 2007[22]	Moderate	Strong	Strong	Strong	Strong (balance & gait); Weak (sensory)	Strong	Moderate
Mazuchi 2018[47]	Weak	Strong	Strong	Strong	Strong	Strong	Moderate
Mohapatra 2012[38]	Moderate	Strong	Strong	Weak	Strong	Strong	Moderate
Moon 2015[43]	Weak	Strong	Strong	Weak	Strong	Strong	Weak
Morioka 2003[44]	Moderate	Strong	Strong	Strong	Weak	Strong	Moderate
Peurala 2002[45]	Weak	Strong	Weak	Moderate	Strong (Motor); Weak (sensory)	Strong	Weak
Tyson 2013[49]	Weak	Strong	Strong	Moderate	Strong	NA	Moderate
Zankel 1969[48]	Weak	Strong	Weak	Weak	Strong	Weak	Weak

NA – not applicable

Table S3. Intervention effects.

Primary author & year	Outcome measures	Post-treatment mean (SD) of included studies		Mean difference between groups	Effect size (SMD)	Bias corrected (Hedges' *g*)	95% CI
		Experimental group	**Control group**				
SOMATOSENSORY							
Cordo 2009[39]	Days to 90% recovery of JPS (exponential)	NA[a]					
Han 2013[40]	JPS error (°)	3.07(1.34)	3.58(1.52)	0.51[c]	0.36[c]	0.35[c]	-0.15, 0.85
Hillier 2006[23]	DPT	NA[a,e]					
	SWM light touch test (normal 2.83)	NA[a]					
Huzmeli 2017[41]	DPT	NA[d]					
	SWM light touch test(normal 2.83)	3.53(0.73)	3.75(0.61)	0.22[c]	0.33[c]	0.32[c]	-0.46, 1.09
	2-point discrimination (cm)	7.28(3.12)	10.73(3.93)	3.45[c]	0.97[c]	0.94[c]	0.13, 1.75
Kwon 2013[52]	Knee JPS error rate – RPM group (PAR; %)	4.27(2.07)	7.84(3.04)	3.57[c]	1.48[c]	1.42[c]	0.45, 2.39
	Knee JPS error rate – RAM group (PAR; %)	8.58(3.73)	7.84(3.04)	-0.74[c]	-0.21[c]	-0.20[c]	-1.08, 0.68
	Knee JPS error rate – RPM group (AAR; %)	3.28(1.07)	6.68(2.34)	3.40[c]	2.14[c]	2.06[c]	1.00, 3.12
	Knee JPS error rate – RAM group (AAR; %)	9.69(4.07)	6.68(2.34)	-3.01[c]	-0.83[c]	-0.80[c]	-1.71, 0.11
Lee 2015[42]	JPS error (unit NR)	1.76(0.63)	3.11(0.80)	1.35[c]	1.87[c]	1.83[c]	1.05, 2.61
Lynch 2007[22]	DPT (number of correct responses out of 10)	NA[d]					
	SWM light touch test (normal 2.83)[f]	2.11(1.45)	2.45(1.29)	0.34[c]	0.25[c]	0.24[c]	-0.62, 1.10

Study	Measure						
Mazuchi 2018[47]	Knee JPS absolute error (°)	6.00(3.60)	4.60(3.00)	-1.40[c]	-0.42[c]	-0.39[c]	-0.76, 1.53
Moon 2015[43]	Knee JPS error (°)	6.80(3.67)	7.04(4.41)	0.24[c]	0.06[c]	0.06[c]	-0.66, 0.77
Morioka 2003[44]	2-point discrimination distance (unit NR)	NA[e]					
	Hardness discrimination	NA[e]					
Peurala 2002[45]	Skin sensitivity (VAS 0-20)	NA[a]					
	SEP (1=normal, 2 = minor change, 3 = abnormal)	NA[a]					
Tyson 2013[49]	Ankle proprioception detection threshold – JPS PF (°)	NA[b]					
	Ankle proprioception detection threshold – JPS DF (°)	NA[b]					
Zankel 1969[48]	Vibration (microns)	NA[e]					

BALANCE

Study	Measure						
Aruin 2012[46]	Weight distribution on affected side (%BW)	49.20(3.20)	42.20(3.90)	7.00	1.96	1.87	0.76, 2.98
	BBS (0-56)	44.80(4.00)	37.70(3.40)	7.10	1.91	1.82	0.72, 2.92
Cordo 2009[39]	Weight distribution on affected side (%BW)	NA[a]					
Han 2013[40]	BBS (0-56)	44.16(7.84)	42.39(6.87)	1.77	0.24	0.24	-0.26, 0.74
	Postural sway area EO (mm2/s)	38.89(21.21)	54.36(15.50)	15.47[c]	0.83[c]	0.82[c]	0.30, 1.34
	Postural sway area EC (mm2/s)	35.56(12.72)	52.85(19.31)	17.29[c]	1.06[c]	1.04[c]	0.51, 1.57
Hillier 2006[23]	Postural sway path length (unit NR)	NA[a]					
Huzmeli 2017[41]	BBS (0-56)	43.15(16.86)	41.15(11.81)	2.00	0.14	0.13	-0.64, 0.90

Study	Measure						
	FRT (cm) in sitting	36.84(9.59)	24.30(6.99)	12.54	1.49	1.45	0.58, 2.31
Lee 2015[42]	Weight distribution on affected side (affected:unaffected ratio)	9.48(5.80)	11.74(2.02)	2.26[c]	0.52[c]	0.51[c]	-0.15, 1.17
	BBS (0-56)	44.61(6.08)	41.22(4.43)	3.39	0.64	0.62	-0.04, 1.29
Lynch 2007[22]	BBS (0-56)	44.56(9.21)	43.91(11.21)	0.65	0.06	0.06	-0.80, 0.92
Mohapatra 2012[38]	Weight distribution on affected side (%BW)	37.90(0.05)	27.40(0.06)	10.50	188.25	172.04	100.14, 243.94
	BBS (0-56)	41.20(1.90)	36.70(2.40)	4.50	2.05	1.88	0.45, 3.30
Morioka 2003[44]	Postural sway locus length EO (cm)	40.40(11.90)	52.40(21.20)	12.00[c]	0.68[c]	0.66[c]	-0.13, 1.45
	Postural sway locus length EC (cm)	72.60(37.50)	83.70(38.00)	11.10[c]	0.29[c]	0.28[c]	-0.49, 1.06
Tyson 2013[49]	FRT (cm)	NA[b]					

GAIT

Study	Measure						
Aruin 2012[46]	10m path gait velocity (m/s)	0.51(0.10)	0.34(0.70)	0.17	0.34	0.32	-0.61, 1.25
Cordo 2009[39]	5m path gait velocity (m/s)	NA[a]					
Lynch 2007[22]	10MWT time (s)	21.90(20.88)	16.19(11.70)	-5.71[c]	-0.34[c]	-0.33[c]	-1.19, 0.53
Mohapatra 2012[38]	5m path gait velocity (m/s)	0.55(0.20)	0.28(0.10)	0.27	1.77	1.62	0.25, 2.98
Peurala 2002[45]	10MWT time (s)	NA[a]					
Tyson 2013[49]	10MWT gait velocity (m/s)	NA[b]					

MOTOR IMPAIRMENT AND LEG FUNCTION (statistically analysed but not meta-analysed)

Study	Measure						
Aruin 2012[46]	FMA-LE (0-100)	77.40(3.60)	76.60(2.60)	0.80	0.25	0.24	-0.69, 1.16

Study	Measure						
Cordo 2009[39]	Days to 90% recovery of ankle DF strength	NA[a]					
	Days to 90% recovery of ankle PF strength	NA[a]					
Da Silva Ribeiro 2015[51]	FMA-balance	12.90(1.80)	11.90(1.80)	1.00	0.56	0.54	-0.19, 1.27
	FMA-sensation	19.30(7.50)	22.50(2.50)	-3.20	-0.57	-0.56	-1.29, 0.17
	FMA-LE coordination	5.50(1.00)	5.30(1.10)	0.20	0.19	0.19	-0.53, 0.90
	FMA-LE motor function	23.40(5.60)	24.80(4.50)	-1.40	-0.28	-0.27	-0.99, 0.45
Huzmeli 2017[41]	Barthel Index (0-100)	85.76(13.66)	68.16(18.01)	17.60	1.10	1.07	0.24, 1.89
Lee 2015[42]	TUG (s)	24.89(8.02)	26.38(7.16)	1.49[c]	0.20[c]	0.19[c]	-0.46, 0.85
Lynch 2007[22]	ILAS	0.33(0.50)	0.33(1.01)	0.00	0.00	0.00	-0.86, 0.86
Mohapatra 2012[38]	FMA-LE (0-100)	89.00(0.90)	86.00(4.00)	3.00	0.99	0.71	-0.51, 1.94
Peurala 2002[45]	MMAS (0-56)	NA[a]					
Tyson 2013[49]	Ankle PF strength	NA[b]					
	Ankle DF strength	NA[b]					

SD – standard deviation; SMD – standardised mean difference; CI – confidence interval; NA – not applicable (these studies were not included in data synthesis); JPS – joint position sense; DPT – distal proprioception test; RPM – repeated passive movement; RAM – repeated active movement; PAR – passive angle repositioning; AAR – active angle repositioning; VAS – visual analogue scale; SWM – Semmes-Weinstein monofilaments; SEP – somatosensory evoked potentials; BBS – Berg Balance Scale; %BW – percentage of body weight; FRT – Functional Reach Test; 10MWT – 10 metre walk test; FMA-LE – Fugl-Meyer Assessment for lower extremity; PF – plantarflexion; DF – dorsiflexion; TUG – Timed Up and Go test; ILAS - Iowa Level of Assistance Scale; MMAS – modified Motor Assessment Scale.