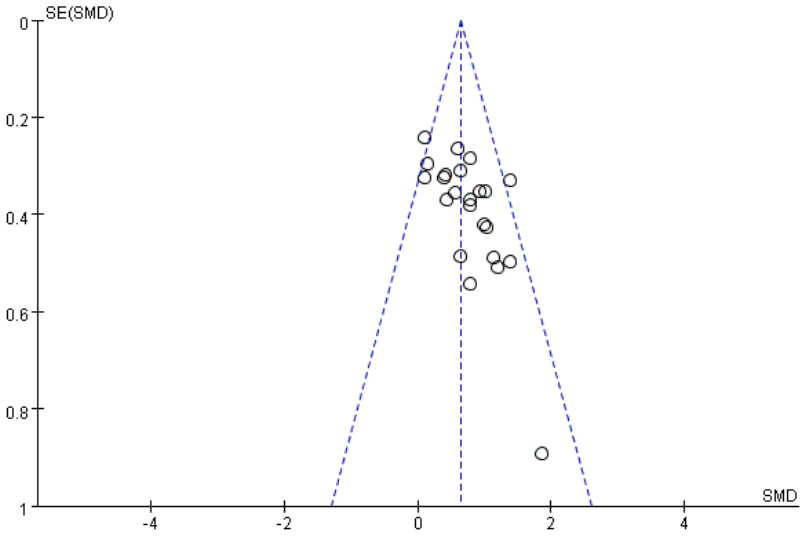
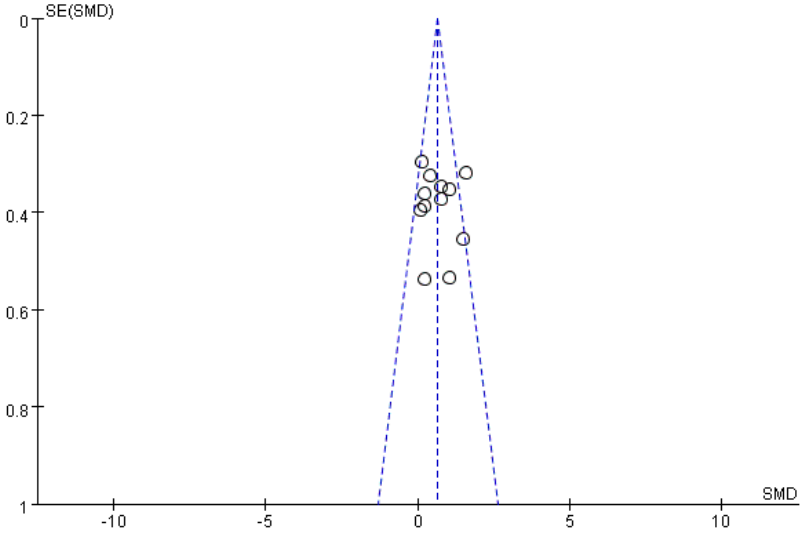
Supplementary Figure S1. Funnel Plots for the comparison of upper-extremity Fugl-Meyer assessment scores between electrical stimulation and placebo groups

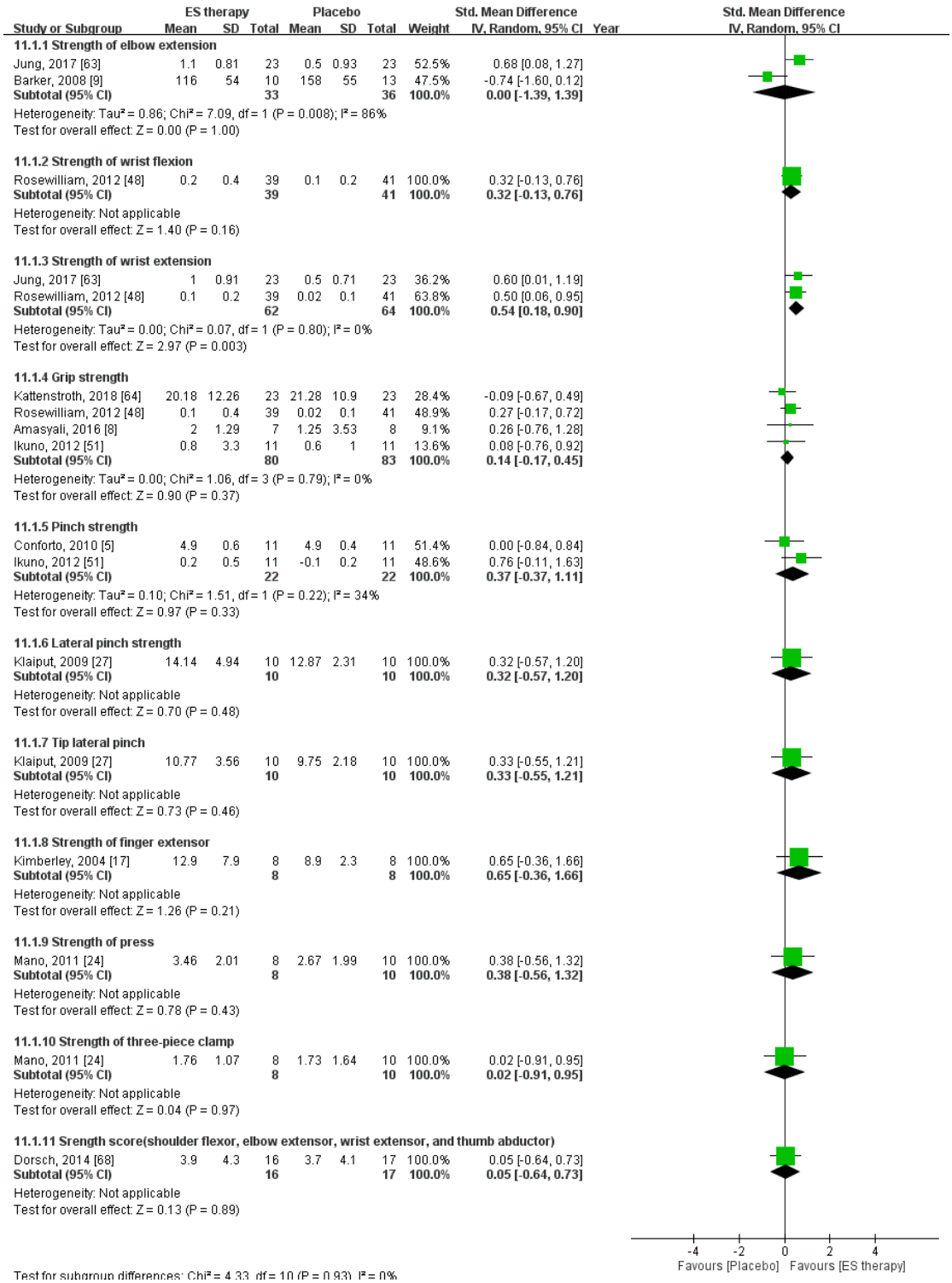
1a. Immediately after treatment



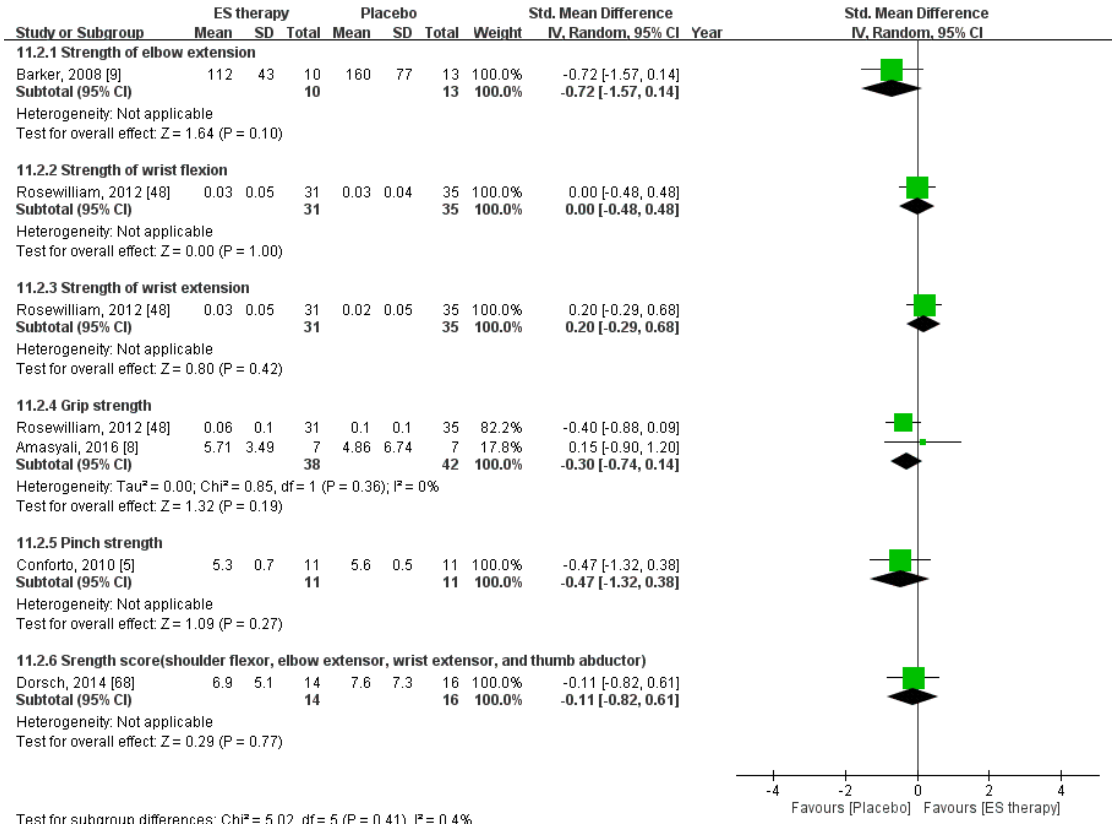
1b. At follow-up



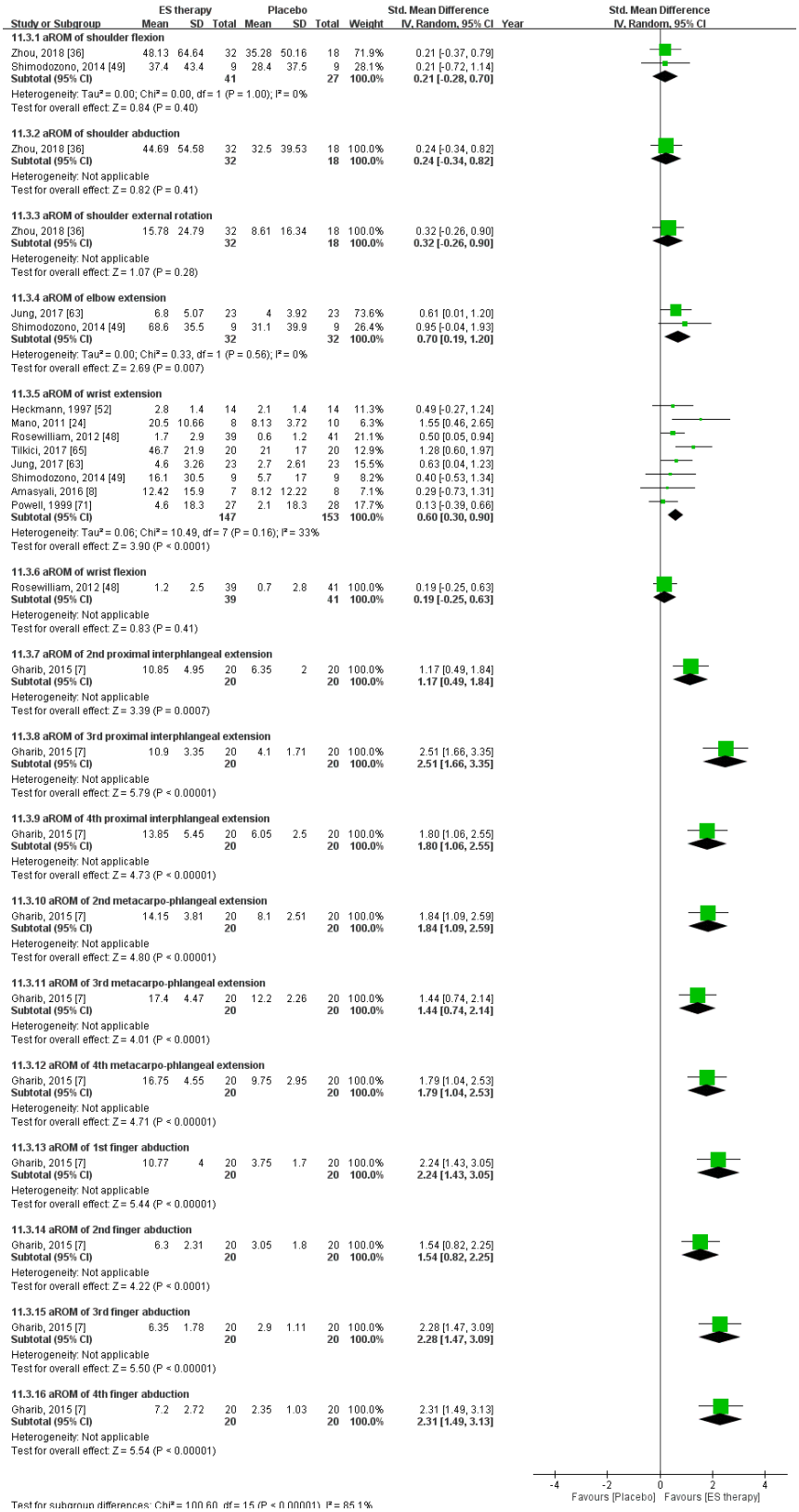
Supplementary Figure S2. Forest plots for upper-extremity muscle strength in the electrical stimulation and placebo groups immediately after treatment



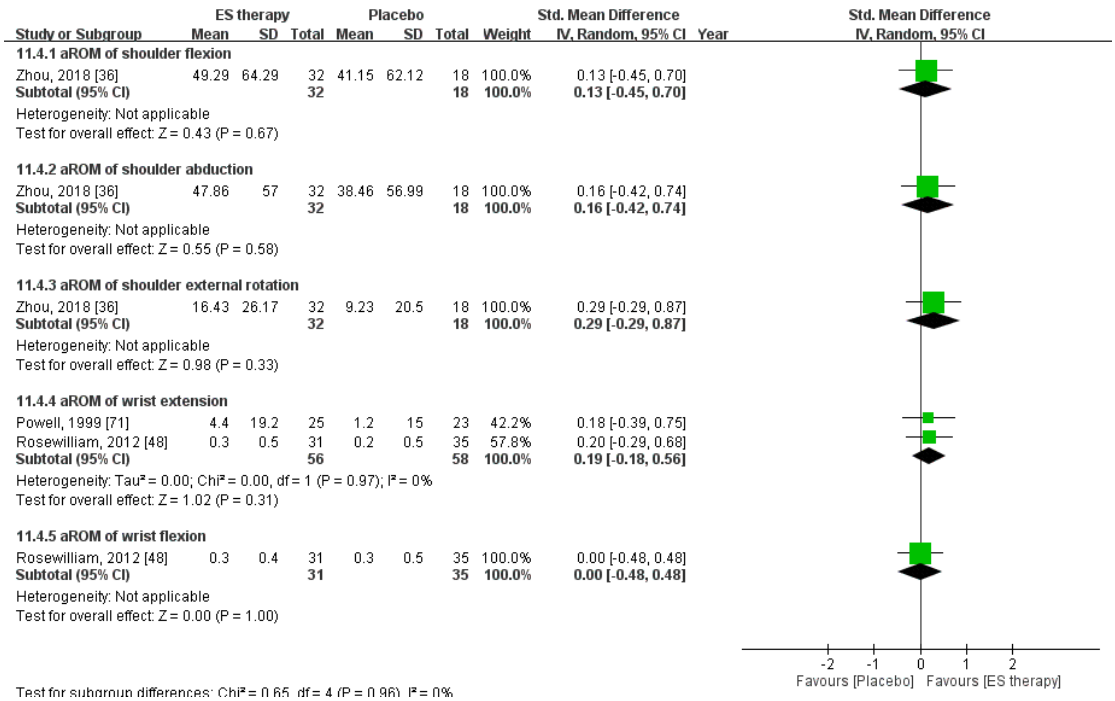
Supplementary Figure S3. Forest plots for upper-extremity muscle strength in the electrical stimulation and placebo groups at follow-up



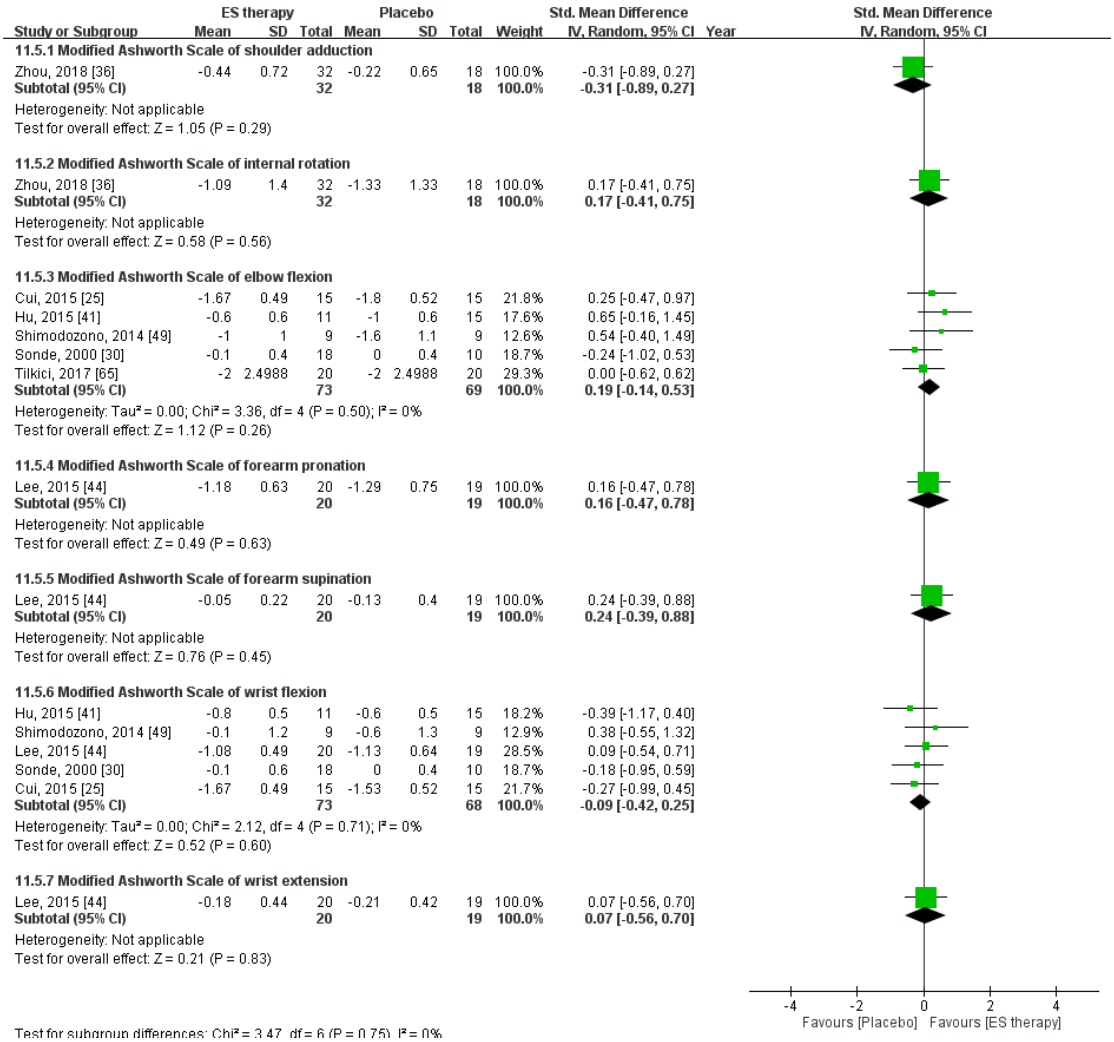
Supplementary Figure S4. Forest plots for upper-extremity range of motion in the electrical stimulation and placebo groups immediately after treatment



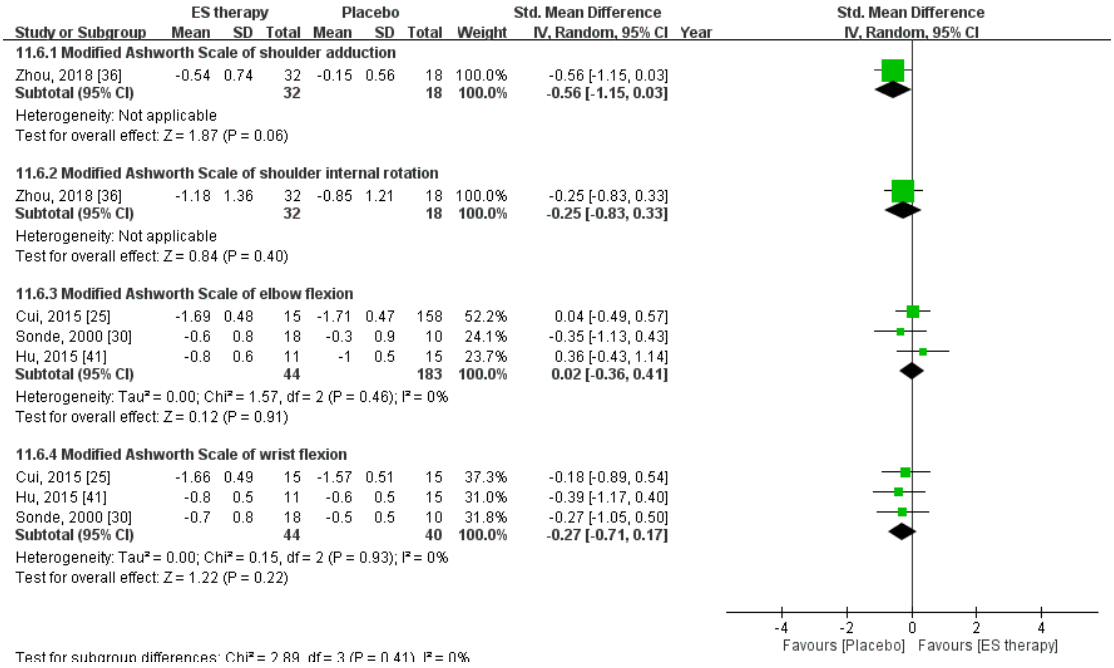
Supplementary Figure S5. Forest plots for upper-extremity range of motion in the electrical stimulation and placebo groups at follow-up



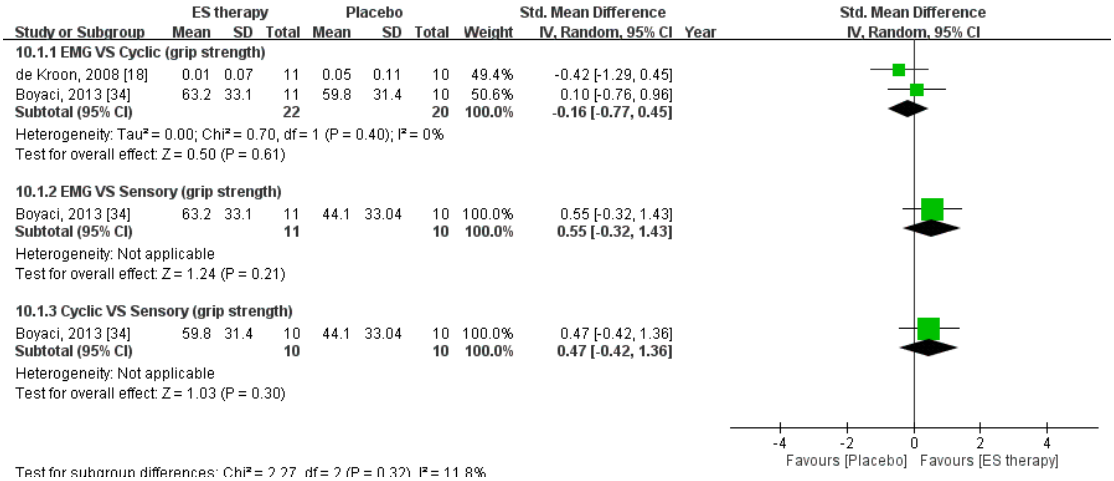
Supplementary Figure S6. Forest plots for upper-extremity spasticity in the electrical stimulation and placebo groups immediately after treatment



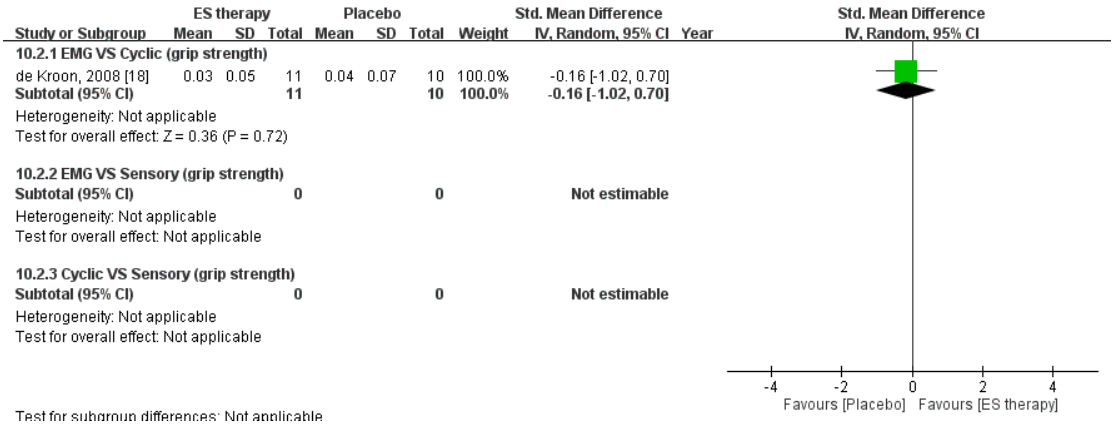
Supplementary Figure S7. Forest plots for upper-extremity spasticity in the electrical stimulation and placebo groups at follow-up



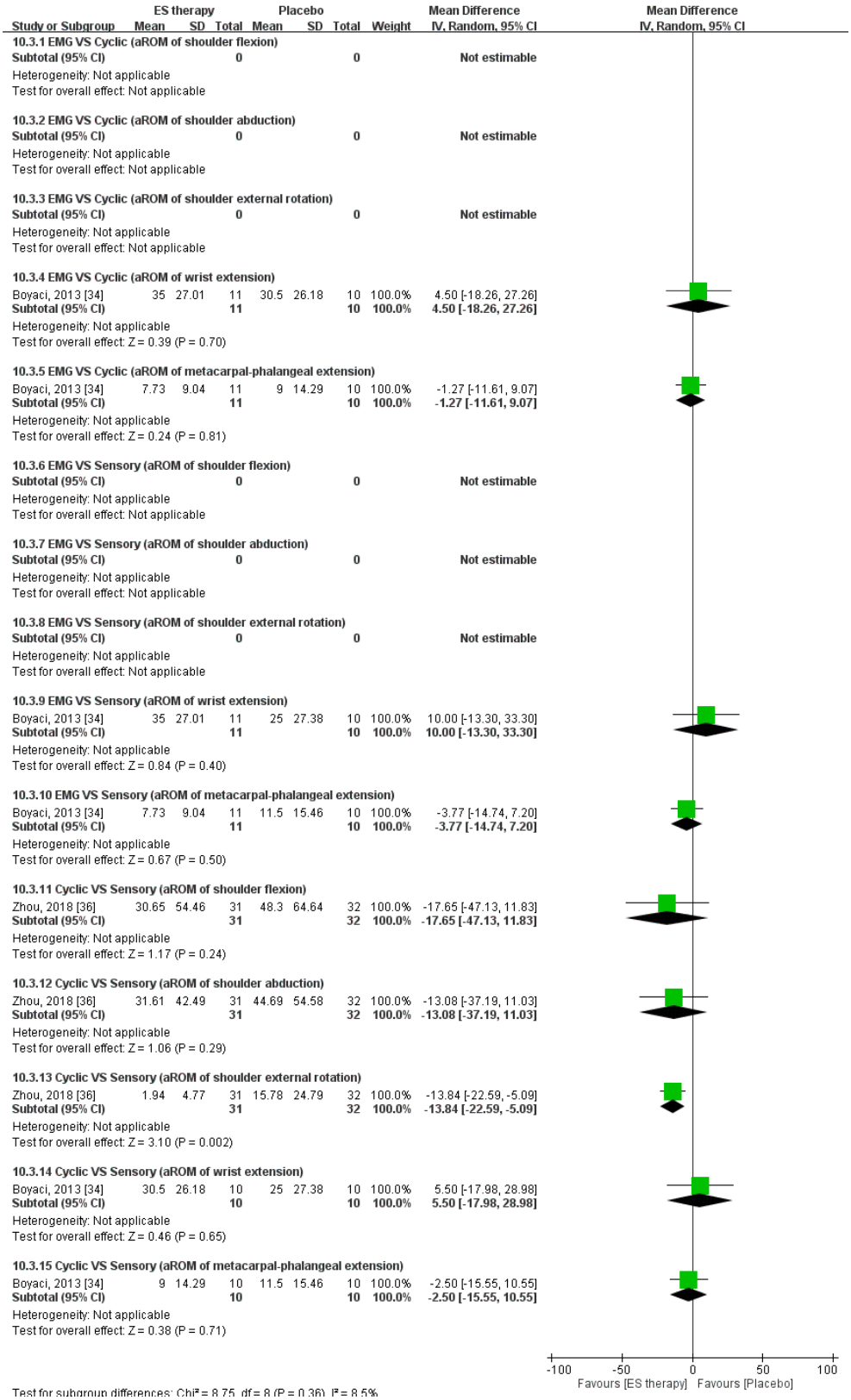
Supplementary Figure S8. Forest plots for upper-extremity muscle strength in the 3 types of electrical stimulation groups immediately after treatment



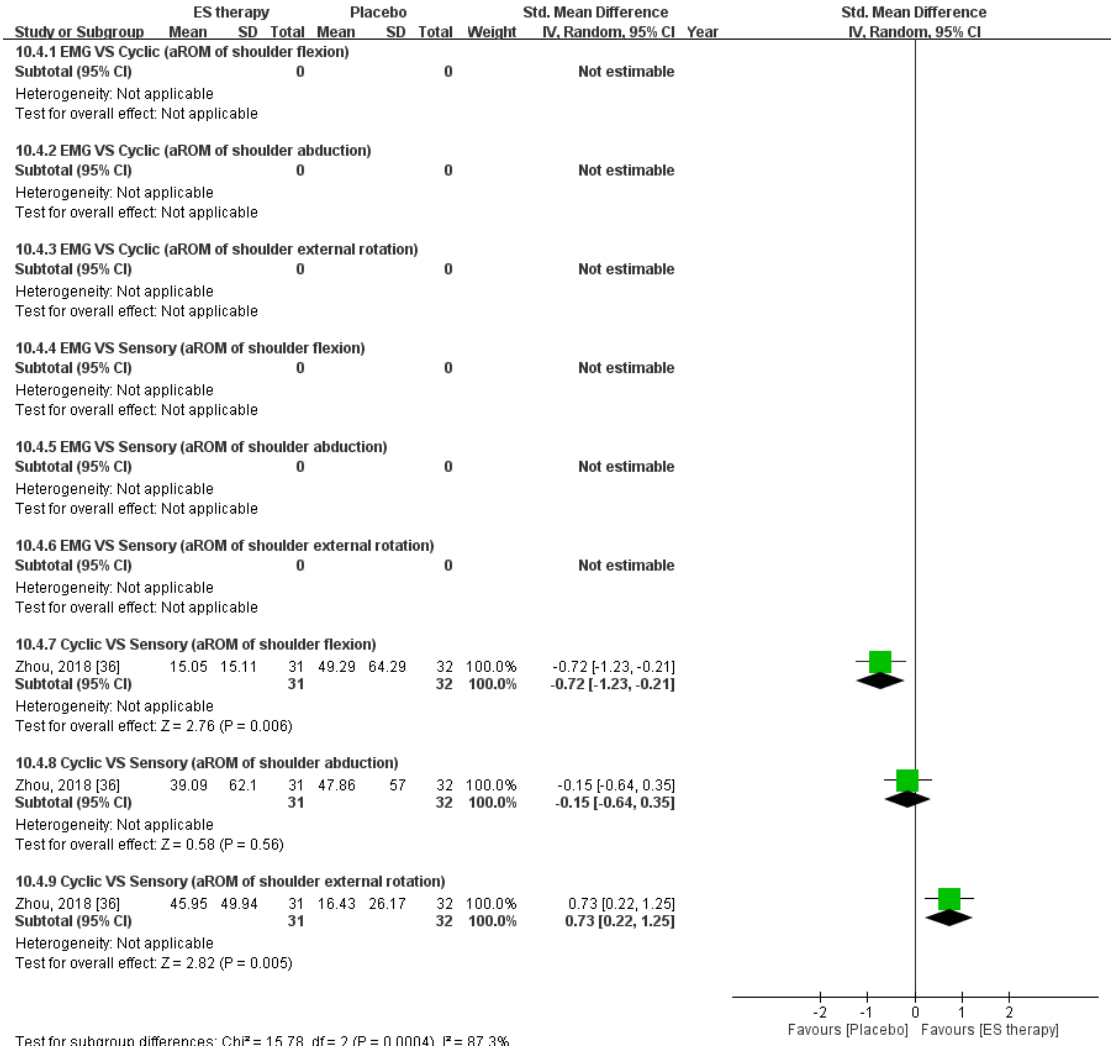
Supplementary Figure S9. Forest plots for upper-extremity muscle strength in the 3 types of electrical stimulation groups at follow-up



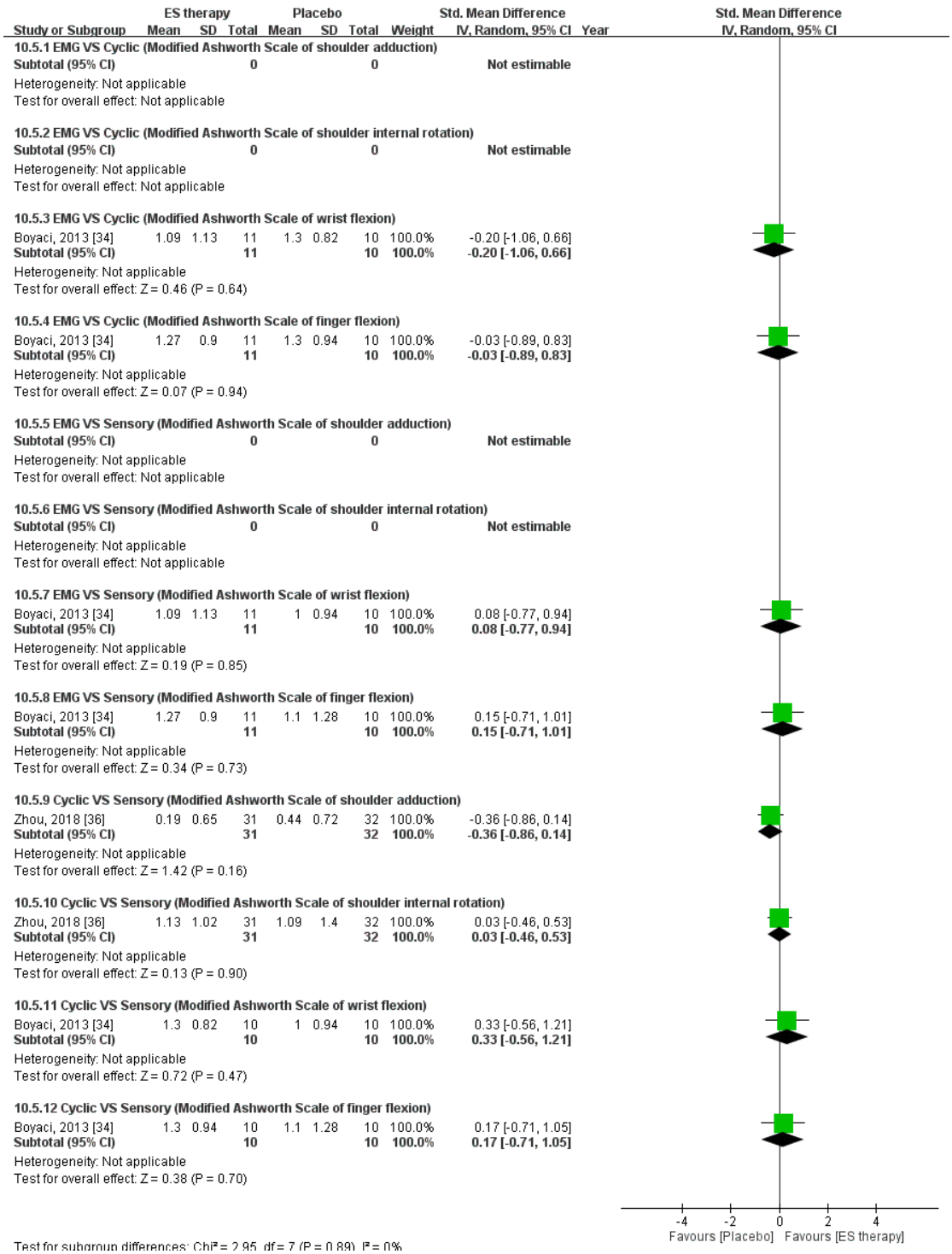
Supplementary Figure S10. Forest plots for upper-extremity range of motion in the 3 types of electrical stimulation groups immediately after treatment



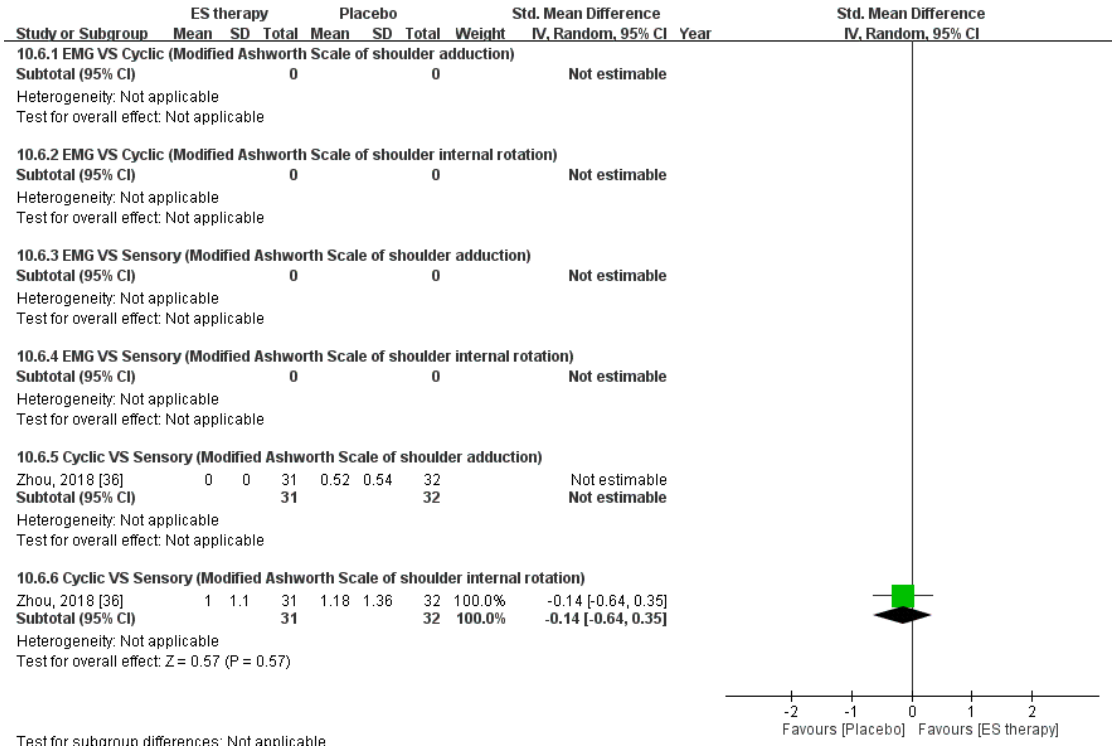
Supplementary Figure S11. Forest plots for upper-extremity range of motion in the 3 types of electrical stimulation groups at follow-up



Supplementary Figure S12. Forest plots for upper-extremity spasticity in the 3 types of electrical stimulation groups immediately after treatment



Supplementary Figure S13. Forest plots for upper-extremity spasticity in the 3 types of electrical stimulation groups at follow-up



Test for subgroup differences: Not applicable

113 Supplementary Table S1. Literature Search Strategies for Databases

114 (1). Literature Search Strategy for the PubMed Database

No. 1 Population	(("stroke"[MeSH Terms] OR "stroke"[All Fields]) OR (cerebro-vascular[All Fields] AND ("accidents"[MeSH Terms] OR "accidents"[All Fields] OR "accident"[All Fields])) OR ("stroke"[MeSH Terms] OR "stroke"[All Fields] OR "cva"[All Fields]))
No. 2 Intervention (1)	(("electromyography"[MeSH Terms] OR "electromyography"[All Fields] OR "emg"[All Fields]) OR electromyograph[All Fields] OR electromyographic[All Fields] OR electromyography-driven[All Fields] OR electromyography-triggered[All Fields] OR electromyography-controlled[All Fields] OR electromyogram-triggered[All Fields] OR electromyogram-driven[All Fields] OR electromyogram-controlled[All Fields] OR electromyographic-triggered[All Fields] OR electromyographic-driven[All Fields] OR active[All Fields] OR cyclic[All Fields] OR passive[All Fields] OR somatosensory[All Fields] OR sensory[All Fields] OR cutaneous[All Fields] OR (low[All Fields] AND level[All Fields]) OR neuromuscular[All Fields])
No. 3 Intervention (2)	(("electric stimulation"[MeSH Terms] OR ("electric"[All Fields] AND "stimulation"[All Fields]) OR "electric stimulation"[All Fields] OR ("electrical"[All Fields] AND "stimulation"[All Fields]) OR "electrical stimulation"[All Fields]) OR ("ethics"[Subheading] OR "ethics"[All Fields] OR "es"[All Fields]) OR stimulation[All Fields]))
No. Type of study	(("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trial"[All Fields] OR "randomised controlled trial"[All Fields]) OR RCT[All Fields] OR (random*[All Fields]))
Search	No. 1 and No. 2 and No. 3 and No. 4

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(2). Literature Search Strategy for the Cochrane Library Database

No. 1 Population	stroke or cerebro-vascular accident or CVA in Title, Abstract, Keywords
No. 2 Intervention (1)	EMG or electromyograph or electromyographic or electromyography-driven or electromyography-triggered or electromyography-controlled or electromyogram-triggered or electromyogram-driven or electromyogram-controlled or electromyographic-triggered or electromyographic-driven or electromyographic-controlled or active or cyclic or passive or somatosensory or sensory or cutaneous or low level or neuromuscular in Title, Abstract, Keywords
No. 3 Intervention (2)	electrical stimulation or ES or stimulation in Title, Abstract, Keywords
No. 4 Type of study	randomized controlled trial or RCT or random* in Title, Abstract, Keywords
Search	No. 1 and No. 2 and No. 3 and No. 4

(3). Literature Search Strategy for the Embase Database

No. 1 Population	'stroke':ti,ab,kw OR 'cerebro-vascular accident':ti,ab,kw OR 'cva':ti,ab,kw
No. 2 Intervention (1)	'emg':ti,ab,kw OR 'electromyograph':ti,ab,kw OR 'electromyographic':ti,ab,kw OR 'electromyography-driven':ti,ab,kw OR 'electromyography-triggered':ti,ab,kw OR 'electromyography-controlled':ti,ab,kw OR 'electromyogram-triggered':ti,ab,kw OR 'electromyogram-driven':ti,ab,kw OR 'electromyogram-controlled':ti,ab,kw OR 'electromyographic-triggered':ti,ab,kw OR 'electromyographic-driven':ti,ab,kw OR 'electromyographic-controlled':ti,ab,kw OR 'active':ti,ab,kw OR 'cyclic':ti,ab,kw OR 'passive':ti,ab,kw OR 'somatosensory':ti,ab,kw OR 'sensory':ti,ab,kw OR 'cutaneous':ti,ab,kw OR 'low level':ti,ab,kw OR 'neuromuscular':ti,ab,kw
No. 3 Intervention (2)	'electrical stimulation':ti,ab,kw OR 'es':ti,ab,kw OR 'stimulation':ti,ab,kw
No. 4 Type of study	'randomized controlled trial':ti,ab,kw OR 'rct':ti,ab,kw OR 'random*':ti,ab,kw
Search	No. 1 and No. 2 and No. 3 and No. 4

123 (4). Literature Search Strategy for the Scopus Database

No. 1 Population	ALL (stroke OR cerebro-vascular AND accident OR cva)
No. 2 Intervention (1)	ALL (emg OR electromyograph OR electromyographic OR electromyography-driven OR electromyography-triggered OR electromyography-controlled OR electromyogram-triggered OR electromyogram-driven OR electromyogram-controlled) OR ALL (electromyographic-triggered OR electromyographic-driven OR electromyographic-controlled OR active OR cyclic OR passive OR somatosensory OR sensory OR cutaneous OR low AND level OR neuromuscular
No. 3 Intervention (2)	ALL (electrical AND stimulation OR es OR stimulation)
No. 4 Type of study	ALL (randomized AND controlled AND trial OR rct OR random*)
Search	No. 1 and No. 2 and No. 3 and No. 4

Supplementary Table S2. Characteristics of the included trials								
Study	**Characteristics of electrical stimulation and placebo treatments (no. of patients)**		**Test time, follow-up period**	**Mean (or median) baseline functional assessment**	**Mean (or median) age**	**Mean (or median) duration after stroke**	**Outcome measures**	**Country**
	Intervention group (time of each session/frequency or time/duration)	**Placebo group**						
Wilson, 2016[3]	I1: EMG-triggered ES, 20–40 Hz, over distal UE; 40 min/bid/8 wk (n = 41) I2: Cyclic ES, 20–40 Hz, over distal UE; 40 min/bid/8 wk (n = 39)	Sensory ES, 30 Hz, over distal UE (n = 42)	4 wk (during Tx), Post Tx, 1, 3, and 6 mo	UE–FMA I1: 29.8 I2: 27.5 P: 26.8	I1: 58.6 y I2: 55.0 y P: 55.8 y	I1: 2.9 mo I2: 2.0 mo P: 3.2 mo	UE-FMA, modified AMAT	United States of America
Miyasaka, 2016[4]	Sensory ES, 20 Hz, over proximal UE; 60 min/FIW/2 wk (n = 15)	No ES (n = 15)	Post Tx	UE–FMA I: 15 P: 14	I: 64.9 y P: 56.9 y	I: 66.3 d P: 65.7 d	FMA, ROM	Japan
Conforto, 2010[5]	Sensory ES, 1 Hz, over median nerve; 2 h/TIW/4wk (n = 11)	Sham ES, over median nerve; 2 h/TIW/4wk (n = 11)	Post Tx, 1–2 mo	UE–FMA I: 90.9% P: 83.3%	I: 59.3 y P: 64.2 y	I: 53.1 d P: 53.5 d	JTHFT, pinch strength, FIM	Brazil

Hsu, 2010[6]	I1: Cyclic ES, over proximal and distal UE; 60 min/FIW/4 wk (n = 22) I2: Cyclic ES, over proximal and distal UE ; 30 min/FIW/4 wk (n = 22)	No ES (n = 22)	Post Tx, 2 mo	UE–FMA I1: 7.5 I2: 8.3 P: 6.6	I1: 60.2 y I2: 62.0 y P: 65.6 y	I1: 23.3 d I2: 21.0 d P: 17.4 d	UE-FMA, ARAT, MAL	Taiwan
Gharib, 2015[7]	Cyclic ES, 20 Hz, over distal UE; 30 min/TIW/8 wk (n = 20)	Sham ES, over distal UE; 30 min/TIW/8 wk (n = 20)	Post Tx	Motor Assessment Scale I: 2.95 P: 2.5	I: 54.9 y P: 54.0 y	I: 11.0 mo P: 11.4 mo	Motor Assessment Scale, JTHFT, ROM	Egypt
Amasyali, 2016[8]	I1: EMG-triggered ES, 50 Hz, over distal UE; 30 min/FIW/3 wk (n = 7) I2: Mirror therapy (n = 9)	No ES (n = 8)	Post Tx, 3 mo	UE–FMA I1: 41.0 I2: 36.6 P: 39.9	I1: 51.3 y I2: 58.8 y P: 65.4 y (All: 58.79 y)	I1: 5.29 mo I2: 4.11 mo P: 6.5 mo	UE-FMA, ROM, grip strength, BBT	Turkey
Barker, 2008[9]	I: EMG-triggered ES, over triceps with robotic	P1: Only robotic training; 60	Post Tx, 2 mo	Motor Assessment	I: 61 y P1:67 y	I: 5.0 y P1:3.4 y	Motor Assessment Scale, muscle strength	United Kingdom

	training; 60 min/TIW/4 wk (n = 13)	min/TIW/4 wk (n = 14) P2: No ES (n = 11)		Scale I: 0 P1:1 P2:1	P2:69 y	P2:3.0 y	of triceps, MAS, peak fore, distance reached	
Wu, 2006[16]	I1: Sensory ES, 1 Hz, over the median, ulnar, and radial nerves; 2 h/qd/1 d (n = 9) I2: Sensory ES, 1 Hz, over the peroneal, sural, and tibial nerves; 2 h/qd/1 d (n = 9)	No Tx (n = 9)	Post Tx	UE–FMA All: 87.6%	64.5 y	6.5 y	JTHFT	Canada
Kimberley, 2004[17]	EMG-triggered ES, 50 Hz, over distal UE; 6 h/10 times/3 wk (n = 8)	Sham ES, 50 Hz, over distal UE; 6 h/10 times/3 wk (n = 8)	Post Tx	BBT I: 23.7 P: 23	60.1 y	35.5 mo	BBT, MAL, JTFHT, strength of index extensor, finger tracking, fMRI	United States of America

de Kroon, 2008[18]	EMG-triggered ES, 35 Hz, over distal UE; 30 min/tid/6 wk (n = 11)	Cyclic ES, 35 Hz, over distal UE; 30 min/tid/6 wk (n = 10)	4 wk (during Tx), post Tx, 1.5 mo	UE–FMA I: 38.4 P: 29.0	I: 57.4 y P: 60.6 y	I: 27.0 mo P: 16.5 mo	ARAT, grip strength, UE-FMA, motricity index	Netherlands
Church, 2006[19]	Cyclic ES, 30 Hz, over proximal UE; 1 h/tid/4 wk (n = 90)	Sham ES, 30 Hz, over proximal UE; 1 h/tid/4 wk (n = 86)	Post Tx, 2 mo	Motricity Index I: 61.3 P: 63.3	I: 75.5 y P: 73.5 y	N/A	ARAT, Frenchay Arm Test, Motricity Index, Star Cancellation Test, pain scales, Nottingham extended activity of daily living Index, Nottingham Health Profile, Oxford Handicap Scale	United Kingdom
Cauraugh, 2002[20]	I1: EMG-triggered ES, over distal UE in unilateral movement group; 90 min/BIW/2 wk (n = 10) I2: EMG-triggered ES, over distal UE in bilateral	No ES (n = 5)	Post Tx	N/A	All:63.7 y	All:39.1 mo	BBT, motor reaction time, sustained muscle contraction	United States of America

	movement group; 90 min/BIW/2 wk (n = 10)							
Pan, 2018[21]	Sensory ES, 100 Hz, over median nerve; 40 min/BIW/8 wk (n = 6)	Sham ES, 100 Hz, over median nerve; 40 min/BIW/8 wk (n = 6)	4wk (during Tx), post Tx, 1 mo	UE–FMA I: 48.3 P: 47.3	I: 54.5 y P: 58.5 y	I: 38.5 mo P: 37.8 mo	UE-FMA, Corticomuscular coherence	Taiwan
Kim, 2013[22]	Cyclic ES, 100 Hz, over proximal and distal UE; 30 min/FIW/4 wk (n = 15)	Sham ES; 30 min/FIW/4 wk (n = 15)	Post Tx	UE–FMA I: 42.9 P: 41.0	I: 63.3 y P: 61.3 y	I: 13.6 mo P: 12.3 mo	UE-FMA, manual function test , BBT, MAS	Republic of Korea

Tekeoğlu, 1998[23]	Sensory ES, 100 Hz, over proximal UE; 30 min/FIW/8 wk (n = 30)	Sham ES, 100 Hz, over proximal UE ; 30 min/FIW/8 wk (n = 30)	Post Tx	BI I: 30.4 P: 44.7	I: 55.9 y P: 52.2 y	I: 40.8 d P: 44.3 d	BI, Ashworth Scale	Turkey
Mano, 2011[24]	Cyclic ES, 50 Hz, over distal UE; 20–30 min/TIW/8 wk (n = 8)	No ES (n = 10)	Post Tx, 4wk	NA	74.7 y	6.4 mo	ROM, grip strength	Spain
Cui, 2015[25]	I1: Cyclic ES, 40 Hz, over proximal and distal UE with low amplitude; 12 h/qd/4 wk (n = 15) I2: Cyclic ES, 40 Hz, over proximal and distal UE; 30 min/qd/4 wk (n = 15)	No ES (n = 15)	Post Tx, 1 mo	UE–FMA I1: 17.1 I2: 17.5 P: 17.1	I1: 61.5 y I2: 64.6 y P: 61.5 y	I1: 12.6 wk I2: 12.8 wk P: 14.4 wk	UE-FMA, ARAT, MAS	China

Fleming, 2015[26]	Sensory ES, 10 Hz, over median, ulnar, and radial nerves; 2 h/TIW/4 wk (n = 16)	Sham ES, 10 Hz, over median, ulnar, and radial nerves; 2 h/TIW/4 wk (n = 17)	Post Tx, 3 and 6 mo	UE–FMA I: 43.3 P: 37.5	I: 62.3 y P: 60.6 y	I: 28.9 mo P: 26.6 mo	ARAT, MAL, UE-FMA, goal attainment scale	United Kingdom
Klaiput, 2009[27]	Sensory ES, 10 Hz, over median and ulnar nerves; 120 min/1 time/1 day (n = 10)	Sham ES, 10 Hz, over median and ulnar nerves; 120 min/1 time/1 day (n = 10)	Post Tx	ARAT I: 56.2 P: 56.9	I: 63.0 y P: 64.5 y	I: 11.9 d P: 38.9 d	ARAT, lateral and tip pinch strength	Thailand
Hara, 2008[28]	EMG-triggered ES, over proximal or distal UE; 30-60 min/FIW/5 mo (n = 12)	No ES (n = 10)	Post Tx	N/A	N/A	N/A	ROM, MAS, stroke Impairment Assessment Set, maximal isometric contraction, Ten-Cup-Moving Test, Nine-Hole-Peg Test	Japan

Sullivan, 2012[29]	Sensory ES , 35 Hz, over distal UE, 30 min/bid and FIW/4 wk (n = 20)	Sham ES, 35 Hz, over distal UE; 30 min/bid and FIW/4 wk (n = 18)	Post Tx	UE–FMA I: 29.1 P: 27.4	I: 61.6 y P: 59.5 y	I: 7.7 y P: 6.6 y	UE FMA, AMAT, MAL, Nottingham Stereognosis Assessment, SIS, Tardieu Scale of spasticity, perceptual threshold test with electrical stimulation	United States of America
Sonde, 2000[30]	Sensory ES, 1.7 Hz, over distal UE; 60 min/FIW/3 mo (n = 26)	No ES (n = 18)	Post Tx, 3 y	UE–FMA I: 21.7 P: 26.5	I: 71.0 y P: 73.0 y	I: 9.1 mo P: 8.3 mo	UE-FMA, MAS, BI	Sweden
dos Santos-Fontes, 2013[31]	Sensory ES, 31 Hz, over median nerve; 2 h/qd/4 wk (n = 10)	Sham ES, 31 Hz, over median nerve; 2 h/qd/4 wk (n = 10)	Post Tx, 4 mo	UE–FMA I: 60.0 P: 52.5	I: 52.2 y P: 59.1 y	I: 3.8 y P: 3.3 y	JTHFT	Brazil

Hemmen, 2007[32]	EMG-triggered ES, 35 Hz, over distal UE; 30 min/FIW/12 wk (n = 14)	Cyclic ES, 35 Hz, over distal UE; 30 min/FIW/12 wk (n = 13)	Post Tx, 9 mo	UE–FMA I: 44.2 P: 40.2	I: 62.1 y P: 60.7 y	I: 44.9 d P: 65.5 d	UE-FMA, ARAT	Netherlands
Thorsen, 2013[33]	EMG-triggered ES, over distal UE; 20 min/25 times/5–9 wk (n = 5)	Sensory ES; over distal UE, 20 min/25 times/5–9 wk (n = 6)	Post Tx, 3 mo	ARAT I: 11.6 P: 30.8	I: 39.0 y P: 57.0 y	I: 8 mo P: 9 mo	ARAT, Individually Prioritized Problem Assessment	Italy
Boyaci, 2013[34]	I1: EMG-triggered ES, 50 Hz, over distal UE; 45 min/FIW/3 wk (n = 11) I2: Cyclic ES, 50 Hz, over distal UE; 45 min/FIW/3 wk (n = 10)	Sensory ES, 50 Hz, over distal UE; 45 min/FIW/3 wk (n = 10)	Post Tx	UE–FMA I1: 29.3 I2: 34.8 P: 33.7	I1: 56.1 y I2: 64.4 y P: 57.6 y	I1: 38.1 wk I2: 33.7 wk P: 22.1 wk	UE-FMA, FIM, MAL, MAS, ROM, grip strength, EMG potentials	Turkey
Chae, 1998[35]	Cyclic ES, 25–50 Hz, over distal UE; 1 h/15 times/N/A (n = 14)	Sensory ES, 25–50 Hz; over distal UE; 1 h/15 times/N/A (n = 14)	Post Tx, 1 and 3 mo	UE–FMA I: 11.1 P: 8.3	I: 59.4 y P: 60.0 y	I: 13.6 d P: 17.8 d	UE-FMA, self-care component of FIM	United States of America

Zhou, 2018[36]	Cyclic ES, 15 Hz, over the proximal UE; 60 min/FIW/4 wk (n = 36)	P1: Sensory ES, 100 Hz, over the proximal UE; 60 min/FIW/4 wk (n = 36) P2: No ES (n = 18)	2 wk (during Tx), Post Tx, 1mo	UE–FMA I: 11.0 P1: 20.0 P2: 17.3	I: 59.4 y P1: 58.5 y P2: 63.8 y	I: 73.6 d P1: 100.9 d P2: 105.9 d	UE-FMA, Pain scale, ROM, MAS, Barthel index, stroke-specific quality of the scale	China
Hu, 2015[41]	EMG-triggered ES, over distal UE; N/A/20 times/7 wk (n = 11)	No ES (n = 15)	Post Tx, 3 mo	UE–FMA I: 30.1 P: 29.4	I: 45.6 y P: 49.2 y	I: 4.2 y P: 4.7 y	UE-FMA, ARAT, MAS, EMG parameters	Hong Kong
Lee, 2015[44]	Cyclic ES, 30 Hz, over distal UE; 90–100 min/FIW/4 wk (n = 20)	Sham ES; 90-100 min/FIW/4 wk (n = 19)	Post Tx, 3 mo	UE–FMA I: 30.7 P: 26.89	I: 54.1 y P: 53.8 y	I: 25.4 mo P: 28.0 mo	UE-FMA, MAS, WMFT, MAL, SIS	Taiwan
Marquez-Chin, 2017[45]	Cyclic ES, 40 Hz, over the upper limb muscles according to functional task; 45 min/FIW/12–16 wk (n = 10)	No ES (n = 11)	Post Tx	UE–FMA I: 3.4 P: 4.4	I: 51.0 y P: 65.0 y (All:58.0 y)	I: 29.0 d P: 29.0 d	UE-FMA, self-care component of FIM	Canada
Lin, 2011[46]	Cyclic ES, 30 Hz, over	No ES (n = 23)	2 wk (during	UE–FMA	I: 62.2 y	I: 43.5 d	UE-FMA, MAS, mBI	China

	proximal and distal UE; 30 min/FIW/3 wk (n = 23)		Tx), Post Tx, 1, 3, and 6 mo	I: 8.4 P: 8.2	P: 66.0 y	P: 41.3 d		
Liu, 2004[47]	Cyclic ES, 25–40 Hz, over 2 UE Chinese acupuncture sites ; 30 min/FIW/NA (n = 30)	No ES (n = 30)	Post Tx	UE–FMA I: 12.55 P: 11.86	I: 60.3 y P: 58.6 y	I: 24.6 d P: 25.1 d	UE-FMA, feeding, grooming, and upper dressing components of FIM	China
Rosewilliam, 2012[48]	Cyclic ES, 40 Hz, over distal UE, 30 min/bid and FIW/6 wk (n = 30)	No ES (n = 30)	Post Tx, 3,6, and 9 mo	ARAT I: 0.0 P: 0.6	I: 72.4 y P: 72.7 y	N/A	ARAT, BI, ROM, strength of wrist muscles, grip strength	United Kingdom
Shimodozono, 2014[49]	I1: Repetitive facilitative exercise; cyclic ES, 20 Hz, over proximal and distal UE; 40 min/FIW/4 wk (n = 9) I2: Repetitive facilitative exercise (n = 9)	Conventional arm rehabilitation (n = 9)	Post Tx	UE–FMA I1: 11.4 I2: 8.2 P: 8.7	I1: 61.1 y I2: 61.9 y P: 61.4 y	I1: 6.2 wk I2: 6.8 wk P: 6.7 wk	UE-FMA, ROM, MAS	Japan
Yozbatiran, 2006[50]	Cyclic ES, 2 Hz, over distal UE; 1 h/10 times/N/A (n = 18)	No ES (n = 18)	Post Tx	Hand function test I: 0.55 P: 1.94	I: 69.5 y P: 66.7 y	I: 9.5 d P: 9.8 d	Kinesthesia sense, position sense, hand function test, hand movement test	Turkey
Ikuno, 2012[51]	Sensory ES, 10 Hz, over	No ES (n = 11)	Post Tx	UE–FMA	I: 68.8 y	I: 91.0 d	WMFT, BBT, pinch	Japan

	the median nerve; 1 h/SIW/1 wk (n = 11)			Immediate group: 60.6 Delayed group: 52.5	P: 70.1 y	P: 110.3 d	and grip strength	
Heckmann, 1997[52]	EMG-triggered ES, 80 Hz, over proximal and distal UE; N/A/FIW/4 wk (n = 14)	No ES (n = 14)	Post Tx	BI I: 49.3 P: 48.2	I: 50.1 y P: 54.0 y	I: 56.1 d P: 61.6 d	ROM, spasticity score, pendulum test, BI	Germany
Bhatt, 2007[53]	Tracking training; EMG-triggered ES, 50 Hz, over distal UE; 60 min/10 times/2–3 wk (n = 6)	P1: Tracking training (n = 7) P2: EMG-triggered ES, 50 Hz, over distal UE ; 60 min/10 times/2–3 wk (n = 7)	Post Tx	BBT I: 21.9 P1: 28.7 P2: 25.3	I: 59.8 y P1: 71.1 y P2: 67.7 y	I: 35.2 mo P1: 32.0 mo P2: 30.7 mo	BBT, JTHFT, finger tracking test	United States of America
Cauraugh, 2009[54]	I1: Extra load on the unimpaired hand (coupled bilateral load); EMG-triggered ES, 50 Hz, over distal UE; 90 min/4 times/2 wk (n = 10)	Unilateral movement attempt without assistance (n = 10)	Post Tx	BBT I1: 26 I2: 24.7 P: 20	I1: 68.4 y I2: 67.2 y P: 66.1 y	I1: 6.1 y I2: 5.0 y P: 3.4 y	BBT, median force, median coefficient of variation, median approximate entropy, premotor and motor reaction time	United States of America

	I2: EMG-triggered ES, 50 Hz, over distal UE; 90 min/4 times/2 wk (n = 10)							
Cauraugh(1), 2003[55]	I1: EMG-triggered ES, 5 s duration, 50 Hz, over distal UE; 90 min/4 times/2 wk (n = 10) I2: EMG-triggered ES, 10 s duration, 50 Hz, over distal UE; 90 min/4 times/2 wk (n = 10)	No ES (n = 6)	Post Tx	BBT I1: 15.7 I2: 22.9 P: 15.1	66.4 y	2.8 y	BBT, premotor and motor reaction time, sustained muscle contraction	United States of America
Francisco, 1998[56]	EMG-triggered ES, 20–100 Hz, over distal UE; 30 min/bid and FIW/during hospitalisation (n = 4)	No ES (n = 5)	Post Tx	UE–FMA I: 12.5 P: 21.2	I: 60.3 y P: 69.6 y	I: 17.5 d P: 18.2 d	UE-FMA, feeding, grooming, and upper dressing components of FIM	United States of America
Shin, 2008[57]	EMG-triggered ES, 35 Hz, over distal UE; 30 min/bid and FIW/10 wk (n = 7)	No ES (n = 7)	Post Tx	BBT I: 21.14 P: 22.71	I: 61.0 y P: 54.1 y	I: 18.6 mo P: 19.7 mo	BBT, finger tracking, delay of onset/offset of EMG activity, fMRI	Republic of Korea
Shindo, 2011[58]	EMG-triggered ES, over	No ES (n = 10)	Post Tx	UE–FMA	I: 58.2 y	I: 34.4 d	UE-FMA, ARAT,	Japan

	distal UE; 8 h/qd/3 wk (n = 10)			I: 24.4 P: 23.0	P: 57.9 y	P: 37.0 d	MAL, MAS	
Carrico(1), 2016[59]	Sensory ES, over posterior interosseous, median, and ulnar nerves; 2 h/qd/10 d (n = 10)	Sham ES, over posterior interosseous, median, and ulnar nerves; 2 h/qd/10 d (n = 9)	Post Tx, 1 mo	UE–FMA I: 42 P: 42.4	I: 56.7 y P: 54.6 y	I: 29.5 mo P: 35.8 mo	WMFT, UE-FMA, ARAT	United States of America
Carrico(2), 2016[60]	Sensory ES, over Erb's point and median and radial nerves; 2 h/qd/10 d (n = 18)	Sham ES, over Erb's point and median and radial nerves; 2 h/qd/10 d (n = 18)	Post Tx, 1 mo	UE–FMA I: 25.7 P: 22.8	I: 58.7 y P: 65.4 y (All: 62.1 y)	I: 39.2 mo P: 25.7 mo	WMFT, UE-FMA, ARAT	United States of America
Jeon, 2017[61]	EMG-triggered ES, 35 Hz, over proximal UE; 30 min/FIW/4 wk (n = 10)	Cyclic ES, 35 Hz, over proximal UE, 30 min/FIW/4 wk (n = 10)	Post Tx	UE–FMA I: 18.0 P: 18.6	I: 50.7 y P: 56.9 y	I: 3.9 mo P: 4.6 mo	UE-FMA, subluxation distance, muscle activation, visual analogue score	Republic of Korea
Carrico, 2018[62]	Sensory ES, 10 Hz, over Erb's point and median and radial nerves; 2 h/TIW/6ks (n = 33)	Sham ES, 10Hz, over Erb's point and median and radial nerves; 2	Post Tx, 1 and 4 mo	UE–FMA I: 18.5 P: 18.2	I: 58.0 y P: 63.0 y	I: 7.5 mo P: 6.9 mo	WMFT(time), UE-FMA, ARAT, SIS	United States of America

		h/TIW/6ks (n = 22)						
Jung, 2017[63]	Sensory ES, 100 Hz, over proximal and distal UE; 30 min/FIW/4 wk (n = 23)	Sham ES, 100 Hz, over proximal and distal UE; 30 min/FIW/4 wk (n = 23)	Post Tx	UE–FMA I: 41.9 P: 42.1	I: 54.8 y P: 57.3 y	I: 13.3 mo P: 14.5 mo	UE-FMA, muscle activity, muscle strength, ROM	Republic of Korea
Kattenstroth, 2018[64]	Sensory ES, 20 Hz, over median and ulnar nerve; 45 min/FIW/2 wk (n = 23)	Sham ES, 20 Hz, over median and ulnar nerve; 45 min/FIW/2 wk (n = 23)	Post Tx	WMFT I: 11.8 P: 11.6	I: 64.0 y P: 59.0 y	Total: 3.5wk	JTHFT, Touch threshold, grating orientation task, nine-hole peg test, grip strength, joint position sense assessment	Germany
Tilkici, 2017[65]	Cyclic ES, 20-50 Hz, over distal UE; 30 min/FIW/3 wk (n = 20)	No ES (n = 20)	Post Tx	UE–FMA I: 7.5 P: 5.0	I: 64.5 y P: 61.3 y	I: 10.6 mo P: 10.4 mo	UE-FMA, ROM, MAS, FIM, Duruoz Hand Scale, Nottingham Health Profile	Turkey
Park, 2017[66]	EMG-triggered ES, over distal UE; 30 min/FIW/4 wk (n = 16)	No ES (n = 16)	Post Tx	UE–FMA I: 21.7 P: 23.3	N/A	N/A	UE-FMA, MAL	Republic of Korea
Jonsdottir, 2017[67]	EMG-triggered ES, over	No ES (n = 36)	After 8 and	UE–FMA	I: 68.3 y	I: 4.5 mo	FMA, ARAT,	Italy

	proximal or distal UE; 45 min/FIW/5-6 wk (n = 32)		16 sessions, post Tx, 5 wk	I: 29.4 P: 30.4	P: 67.7 y	P: 3.0 mo	disability of the arm, shoulder and hand questionnaire	
Dorsch, 2014[68]	EMG-triggered ES, over proximal and distal UE; 30repetitions/FIW/4 wk (n = 16)	No ES (n = 17)	Post Tx, 2 mo	Motor Assessment Scale I: 0.9 P: 0.9	I: 66.0 y P: 69.0 y	I: 14.5 d P: 16.8 d	Motor Assessment Scale, muscle strength score	Australia
Cauraugh(2), 2003[69]	I1: EMG-triggered ES, over proximal or distal UE in blocked practice group; 90 min/BIW/2 wk I2: EMG-triggered ES, over proximal or distal UE in random practice group; 90 min/BIW/2 wk (n =28, I1 and I2)	No ES (n = 6)	Post Tx	N/A	All:66.1 y	All:3.2 y	BBT, motor reaction time, sustained muscle contraction	United States of America
Cauraugh, 2000[70]	EMG-triggered ES, over distal UE; 60 min/TIW/2 wk (n = 7)	No ES (n = 4)	Post Tx	N/A	All:61.6 y	All:3.5 y	FMA, BBT, motor reaction time, sustained muscle contraction, Motor Assessment Scale	United States of America

Powell, 1999[71]	Cyclic ES, 20 Hz, over distal UE; 90min/qd/8 wk (n = 30)	No ES (n = 4)	4wk (during Tx), post Tx, 4 mo, 6 mo	Barthel Index I: 20 P: 20	I: 69.0 y P: 66.4 y	I: 23.9 d P: 22.9 d	ARAT, ROM, Grip strength, star cancellation, Ashworth score, Barthel Index, Rankin score	United Kingdom
Gabr, 2005[72]	EMG-triggered ES, over distal UE; 35 min/bid/8 wk, then only exercise for 8 wk (n = 8)	Initially only exercise for 8 wk, then EMG-triggered ES, over distal UE; 35 min/bid/8 wk (n = 4)	Post Tx	UE–FMA I: 12.0 P: 15.83	I: 62.8 y P: 53.8 y	I: 68.1 mo P: 22.0 mo	FMA, ARAT, ROM	United States of America
Barker, 2017[73]	I: EMG-triggered ES, over triceps with robotic training; 60 min/FIW/4 wk (n = 16)	P1: Only robotic training; 60 min/FIW/4 wk (n = 17) P2: No ES (n = 17)	Post Tx, 22wk, 1y	Motor Assessment Scale, upper arm function subscale I: 1 P1:0 P2:0	I: 57.3 y P1:52.4 y P2:51.2 y	I: 39.1 d P1:43.9 d P2:34.7 d	Motor Assessment Scale, muscle strength of triceps, MAS, Ritchie Articular Index, SIS, MAL	United Kingdom
ARAT: Action Research Arm Test; AMAT: Arm Motor Ability Test; BBT: Box and Block Test; bid: twice per day; BIW: twice per week; EMG: electromyography; ES:								

electrical stimulation; FIM: Functional Independence Measure; FIW: 5 times per week; FMA: Fugl-Meyer assessment; I: intervention; JTHFT: Jebsen–Taylor Hand Function Test; MAL: Motor Activity Log; MAS: modified Ashworth scale; mBI: modified Barthel index; min: minute; mo: month; MRI: magnetic resonance imaging; NA: not available; P: placebo; qd: once per day; ROM: range of motion; SIS: Stroke Impact Scale; SIW: 6 times per week; tid: 3 times per day; TIW: 3 times per week; Tx: treatment; UE: upper extremity; wk: week; WMFT: Wolf Motor Function Test; y: years

The outcome measures selected for the meta-analysis are underlined.

Supplementary Table S3. Methodological quality assessment of included trials							
	Random sequence generation	**Allocation concealment**	**Participant and personnel blinding**	**Outcome assessor blinding**	**Incomplete outcome data**	**Selective reporting**	**Other bias**
Wilson, 2016[3]	Computer generated	Unclear [a]	Patient blinding	Blinded	21.3% lost [a]	Low risk	Nil
Miyasaka, 2016[4]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Conforto, 2010[5]	Unclear [a]	Unclear [a]	Patient blinding	Blinded	36.4% lost [a]	Low risk	Nil
Hsu, 2010[6]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	18% lost	Low risk	Nil
Gharib, 2015[7]	Envelope	Unclear [a]	Patient blind	Blinded	None lost	Low risk	Nil
Amasyali, 2016[8]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	12.5% lost	Low risk	Nil
Barker, 2008[9]	Computer generated	Centralized service	No blinding [a]	Blinded	11.9% lost	Low risk	Nil
Wu, 2006[16]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Kimberley, 2004[17]	Unclear [a]	Unclear [a]	Patient blinding	Unclear [a]	None lost	Low risk	Nil
de Kroon, 2008[18]	Computer generated	Sealed envelope	Patient blinding	Blinded	4.5% lost	Low risk	Nil
Church, 2006[19]	Computer generated	Unclear [a]	Patient blinding	Blinded	11.9% lost	Low risk	Nil
Cauraugh, 2002[20]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Pan, 2018[21]	Computer generated	Unclear [a]	Patient blinding	Unclear [a]	None lost	Low risk	Nil
Kim, 2013[22]	Unclear [a]	Unclear [a]	Patient blinding	Unclear [a]	11.8% lost	Low risk	Nil
Tekeoğlu, 1998[23]	Computer generated	Unclear [a]	Patient blinding	Blinded	None lost	Low risk	Nil
Mano, 2011[24]	Unclear [a]	Unclear [a]	Patient blinding	Unclear [a]	None lost	Low risk	Nil

Cui, 2015[25]	Computer generated	Unclear [a]	No blinding [a]	Blinded	11.1% lost	Low risk	Nil
Fleming, 2015[26]	Tossing a coin	Unclear [a]	Patient blinding	Blinded	5.8% lost	Low risk	Nil
Klaiput, 2009[27]	Envelope	Sealed envelope	Patient blinding	Unclear [a]	None lost	Low risk	Nil
Hara, 2008[28]	Computer generated	Unclear [a]	No blinding [a]	Unclear [a]	9.1% lost	Low risk	Nil
Sullivan, 2012[29]	Computer generated	Unclear [a]	Patient blinding	Blinded	5.2% lost	No result for the Tardieu Scale of spasticity [a]	Nil
Sonde, 2000[30]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	36.4% lost [a]	Low risk	Nil
dos Santos-Fontes, 2013[31]	Computer generated	Unclear [a]	Patient blinding	Blinded	35.0% lost [a]	Low risk	Nil
Hemmen, 2007[32]	Computer generated	Sealed envelope	Patient blinding	Blinded	18.5% lost	Low risk	Nil
Thorsen, 2013[33]	Minimisation	Unclear [a]	Patient blinding	Blinded	27.2% lost [a]	Low risk	Nil
Boyaci, 2013[34]	Envelope	Unclear [a]	Patient blinding	Blinded	None lost	Low risk	Nil
Chae, 1998[35]	Computer generated	Unclear [a]	Patient blinding	Blinded	None lost	Low risk	Dropout patients were excluded from the study [a]
Zhou, 2018[36]	Computer generated	Unclear [a]	Patient blinding	Blinded	21.1% lost [a]	Low risk	Nil
Hu, 2015[41]	Computer generated	Unclear [a]	No blinding [a]	Blinded	Unclear	Low risk	Nil
Lee, 2015[44]	Random table	Sealed envelope	Patient blinding	Blinded	None lost	Low risk	Nil
Marquez-Chin, 2017[45]	Computer generated	Sealed envelope	No blinding [a]	Blinded	None lost	Low risk	Nil
Lin, 2011[46]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	19.5% lost	Low risk	Nil

Liu, 2004[47]	Random table	Unclear [a]	No blinding [a]	Unclear [a]	19.5% lost	Low risk	Nil
Rosewilliam, 2012[48]	Computer generated	Unclear [a]	No blinding [a]	Blinded	54.4% lost (25.5% died) [a]	Low risk	Nil
Shimodozono, 2014[49]	Computer generated	Unclear [a]	Patient blinding	Blinded	None lost	Low risk	Nil
Yozbatiran, 2006[50]	Ranked order	Unclear [a]	No blind [a]	Unclear [a]	None lost	Low risk	Nil
Ikuno, 2012[51]	Computer generated	Sealed envelope	No blinding [a]	Blinded	None lost	Low risk	Crossover study without a washout period [a]
Heckmann, 1997[52]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Bhatt, 2007[53]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Cauraugh, 2009[54]	Unclear [a]	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Cauraugh(1), 2003[55]	Computer generated	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Francisco, 1998[56]	Computer generated	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Shin, 2008[57]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Shindo, 2011[58]	Computer generated	Unclear [a]	No blinding [a]	Blinded	9.1% lost	Low risk	Nil
Carrico(1), 2016[59]	Computer generated	Unclear [a]	Patient blinding	Blinded	10.5% lost	Low risk	Nil
Carrico(2), 2016[60]	Computer generated	Unclear [a]	Patient blinding	Blinded	13.8% lost	Low risk	Nil
Jeon, 2017[61]	Envelope	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Carrico, 2018[62]	Computer generated	Unclear [a]	Patient blinding	Blinded	29.0% lost [a]	Low risk	Nil
Jung, 2017[63]	Computer generated	Sealed envelope	Patient blinding	Blinded	None lost	Low risk	Nil
Kattenstroth, 2018[64]	Computer generated	Unclear [a]	Patient blinding	Unclear [a]	None lost	Low risk	Nil

Tilkici, 2017[65]	Envelope	Sealed envelope	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Park, 2017[66]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Jonsdottir, 2017[67]	Random order block	Unclear [a]	No blinding [a]	Blinded	36.8% lost [a]	Low risk	Nil
Dorsch, 2014[68]	Computer generated	Centralized service	No blinding [a]	Blinded	9.1% lost	Low risk	Nil
Cauraugh(2), 2003[69]	Random table	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Cauraugh, 2000[70]	Unclear [a]	Unclear [a]	No blinding [a]	Unclear [a]	None lost	Low risk	Nil
Powell, 1999[71]	Computer generated	Sealed envelope	No blinding [a]	Blinded	20% lost [a]	Low risk	Nil
Gabr, 2005[72]	Random table	Unclear [a]	No blinding [a]	Blinded	None lost	Low risk	Nil
Barker, 2017[73]	Computer generated	Sealed envelope	No blinding [a]	Blinded	24% lost [a]	Low risk	Nil
[a] indicates a risk of bias.							

Supplementary Table S4. Result of subgroup analysis of upper-extremity Fugl–Meyer Assessment scores in the comparison between electrical stimulation and placebo groups												
	Immediately After Treatment						**At Follow-up**					
Subgroup	Studies	Participants	SMD [95% CI]	*P*	I^2	References	Studies	Participants	SMD [95% CI]	*P*	I^2	References
1. Patient age												
≤60 year-old	10	351	**0.80 [0.52–1.07]**[a]	<0.00001[b]	31%	8, 36, 41, 44, 45, 47, 58, 59, 62, 63	6	201	**0.81 [0.24–1.38]**[a]	0.005[b]	70%	8, 36, 41, 44, 59, 62
>60 year-old	12	411	**0.56 [0.35–0.77]**[a]	<0.00001[b]	10%	6, 22, 25, 26, 29, 30, 46, 49, 56, 60, 65, 67	6	190	**0.55 [0.24–0.85]**[a]	0.0004[b]	5%	6, 25, 26, 30, 46, 60
Subgroup difference				0.19[c]	42.3%					0.43[c]	0%	
2. Duration of stroke												
Acute (<1 month)	4	134	**0.80 [0.39–1.22]**[a]	0.0002[b]	19%	6, 45, 47, 56	1	36	**0.77 [0.09–1.45]**[a]	0.03[b]	NA	6
Subacute (1-6 month)	6	223	**0.48 [0.13–0.83]**[a]	0.008[b]	36%	25, 36, 46, 49, 58, 67	3	114	0.46 [–0.10 to	0.11[b]	52%	25, 36, 46

									1.02]			
Chronic (>6 month)	12	405	**0.73 [0.52–0.95]**[a]	<0.00001[b]	7%	8, 22, 26, 29, 30, 41, 44, 59, 60, 62, 63, 65	8	241	**0.73 [0.30–1.16]**[a]	0.0008[b]	59%	8, 26, 30, 41, 44, 59, 60, 62
Subgroup difference				0.81[c]	0%					0.70[c]	0%	
3. Stroke severity												
Moderate (upper-extremity Fugl–Meyer Assessment scores: 29-42)	8	276	**0.72 [0.37–1.06]**[a]	<0.0001[b]	46%	8, 22, 26, 41, 44, 59, 63, 67	5	127	**0.63 [0.15–1.11]**[a]	0.009[b]	38%	8, 26, 41, 44, 59
Severe (upper-extremity Fugl–Meyer Assessment scores: 0-28)	15	518	**0.65 [0.47–0.84]**[a]	<0.00001[b]	2%	6, 25, 29, 30, 36, 45, 46, 47, 49, 56, 58, 60, 62, 65, 66	7	264	**0.67 [0.25–1.10**[a]	0.002[b]	63%	6, 25, 30, 36, 46, 60, 62
Subgroup difference				0.94[c]	0%					0.90[c]	0%	

CI: confidence interval; NA: not applicable; SMD: standardized mean difference

[a] indicates a significant difference in the comparison between electrical stimulation and placebo groups in the equivalent *z* test

[b] indicates *P* value of the equivalent *z* test, which is the result of meta-analysis between electrical stimulation and placebo groups

[c] indicates *P* value of Cochran's Q test, which is the result of subgroup analysis between these subgroups

Supplementary Table S5. Results for upper-extremity Fugl–Meyer Assessment subscale scores in the comparison between electrical stimulation and placebo groups

	Immediately After Treatment						**At Follow-up**					
Outcome	Studies	Participants	SMD [95% CI]	*P*	I^2	References	Studies	Participants	SMD [95% CI]	*P*	I^2	References
Fugl–Meyer Assessment-proximal	8	248	**0.75 [0.49–1.00]**[a]	<0.00001	0%	6, 8, 22, 25, 41, 46, 58, 63	5	140	**0.69 [0.29–0.89]**[a]	0.0008	23%	6, 8, 25, 41, 46
Fugl–Meyer Assessment-distal	4	120	**0.62 [0.25–0.99]**[a]	0.001	0%	6, 25, 41, 58	3	89	**0.55 [0.13–0.98]**[a]	0.01	0%	6, 25, 41
Fugl–Meyer Assessment-wrist	4	128	**0.63 [0.23–1.02]**[a]	0.002	16%	8, 22, 46, 63	2	51	0.39 [–0.16 to 0.95]	0.17	0%	8, 46
Fugl–Meyer Assessment-hand	4	128	0.17 [–0.18 to 0.52]	0.34	0%	8, 22, 46, 63	2	51	0.23 [–0.32 to 0.78]	0.41	0%	8, 46
Fugl–Meyer Assessment-coordination	3	91	**0.75 [0.32 to 1.18]** [a]	0.0006	0%	8, 22, 63	1	14	–0.19 [–1.24 to 0.86]	0.72	NA	8

CI: confidence interval; NA: not applicable; SMD: standardized mean difference

[a] indicates a significant difference in the comparison between electrical stimulation and placebo groups in the equivalent *z* test

Supplementary Table S6. Results for voluntary motor control outcomes between EMG-triggered, cyclic, and sensory electrical stimulation groups												
	Immediately After Treatment						**At Follow-up**					
Outcome or Subgroup	Studies	Participants	SMD [95% CI]	*P*	I^2	References	Studies	Participants	SMD [95% CI]	*P*	I^2	References
1. Body function												
EMG-triggered vs cyclic	5	165	−0.08 [−0.39 to 0.23]	0.62	0%	3, 18, 32, 34, 61	3	123	−0.05 [−0.41 to 0.30]	0.78	0%	3, 18, 32
EMG-triggered vs sensory	2	104	0.14 [−0.25 to 0.52]	0.49	0%	3, 34	1	83	0.12 [−0.31 to 0.55]	0.58	NA	3
Cyclic vs sensory	4	192	0.13 [−0.20 to 0.46]	0.43	21%	3, 34-36	3	172	0.17 [−0.22 to 0.55]	0.39	35%	3, 35, 36
CI: confidence interval; EMG: electromyography; NA: not applicable; SMD: standardized mean difference; vs: versus												

Supplementary Table S7. Results for activity outcomes in the comparison between electrical stimulation and placebo groups

	Immediately After Treatment						At Follow-up					
Outcome or Subgroup	Studies	Participants	SMD [95% CI]	*P*	I^2	References	Studies	Participants	SMD [95% CI]	*P*	I^2	References
1. Capacity assessment												
Action Research Arm Test	10	411	**0.70 [0.39−1.02]**[a]	<0.0001	56%	6, 25, 26, 41, 48, 58-60, 62, 67	8	289	**0.93 [0.34−1.52]**[a]	<0.002	81%	6, 25, 26, 41, 48, 59, 60, 62
Jebsen–Taylor Hand Function Test	7	163	1.73 [−0.07 to 3.53]	0.06	94%	5, 7, 16, 17, 31, 53, 64	2	42	**2.1 [1.32−2.89]**[a]	<0.00001	0%	5, 31
Wolf Motor Function Test (functional ability scale)	2	61	**0.66 [0.15−1.18]**[a]	0.01	0%	44, 51	No included study					
Wolf Motor Function Test (time)	5	171	**1.06 [0.26−1.21]**[a]	0.003	76%	44, 51, 59, 60, 62	3	103	**0.77 [0.36−1.17]**[a]	0.0002	0%	59, 60, 62
Box and Block Test	8	146	**0.50 [0.15−0.85]**[a]	0.005	6%	8, 17, 22, 51, 53-55, 57	1	14	−0.13 [−1.18 to 0.92]	0.81	NA	8
2. Perceived performance assessment												

Motor Activity Log (Amount of use)	5	140	**0.49 [0.06 to 0.93]** [a]	0.03	36%	17, 26, 44, 58, 66	3	106	**0.42 [0.00 to 0.85]** [a]	0.05	17%	6, 26, 44
Motor Activity Log (Quality of movement)	5	140	**0.66 [0.16−1.16]**[a]	0.009	49%	17, 26, 44, 58, 66	3	106	**0.41 [0.02−0.79]**[a]	0.04	0%	6, 26, 44

CI: confidence interval; NA: not applicable; SMD: standardized mean difference

[a] indicates a significant difference in the comparison between electrical stimulation and placebo groups in the equivalent *z* test

Supplementary Table S8. Sensitivity analysis of Jebsen–Taylor Hand Function Test scores in electrical stimulation and placebo groups						
Outcomes	**Studies**	**Participants**	**SMD [95% CI]**	***P***	I^2	**References**
Initial included studies	7	163	1.73 [−0.07 to 3.53]	0.06	94%	5, 7, 16, 17, 31, 53, 64
Data from dos Santos-Fontes et al[31] excluded	6	143	1.55 [−0.43 to 3.54]	0.12	94%	5, 7, 16, 17, 53, 64
Data from Kimberley et al[17] excluded	6	147	1.81 [−0.33 to 3.94]	0.1	95%	5, 7, 16, 31, 53, 64
Data from dos Santos-Fontes et al[31] and Kimberley et al[17] excluded	5	127	1.61 [−0.81 to 4.04]	0.19	95%	5, 7, 16, 53, 64

CI: confidence interval, SMD: standardized mean difference

[a] indicates a significant difference in the comparison between electrical stimulation and placebo groups in the equivalent *z* test.

Supplementary Table S9. Results for activity outcomes between EMG-triggered, cyclic, and sensory electrical stimulation groups												
	Immediately After Treatment						**At Follow-up**					
Outcome or Subgroup	Studies	Participants	SMD [95% CI]	*P*	I^2	References	Studies	Participants	SMD [95% CI]	*P*	I^2	References
1. Activity												
EMG-triggered vs cyclic	4	145	0.07 [−0.25 to 0.40]	0.65	0%	3, 18, 32, 34	3	123	−0.07 [−0.42 to 0.29]	0.72	0%	3, 18, 32
EMG-triggered vs sensory	3	115	0.29 [−0.08 to 0.66]	0.12	0%	3, 33, 34	2	91	0.22 [−0.47 to 0.91]	0.53	23%	3, 33
Cyclic vs sensory	4	192	-0.02 [−0.36 to 0.32]	0.91	25%	3, 34-36	3	172	-0.02 [−0.32 to 0.28]	0.88	0%	3, 35, 36
CI: confidence interval; EMG: electromyography; SMD: standardized mean difference; vs: versus												