Supplementary materials for

The effect and optimal parameters of repetitive transcranial magnetic stimulation (rTMS) on motor recovery in stroke patients: A systematic review and meta-analysis of randomized controlled trials

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Fig S1. Forest plot from the meta-analysis of rTMS on motor evoked potentials showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S2. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different active motor threshold (AMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S3. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different resting motor threshold (RMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.
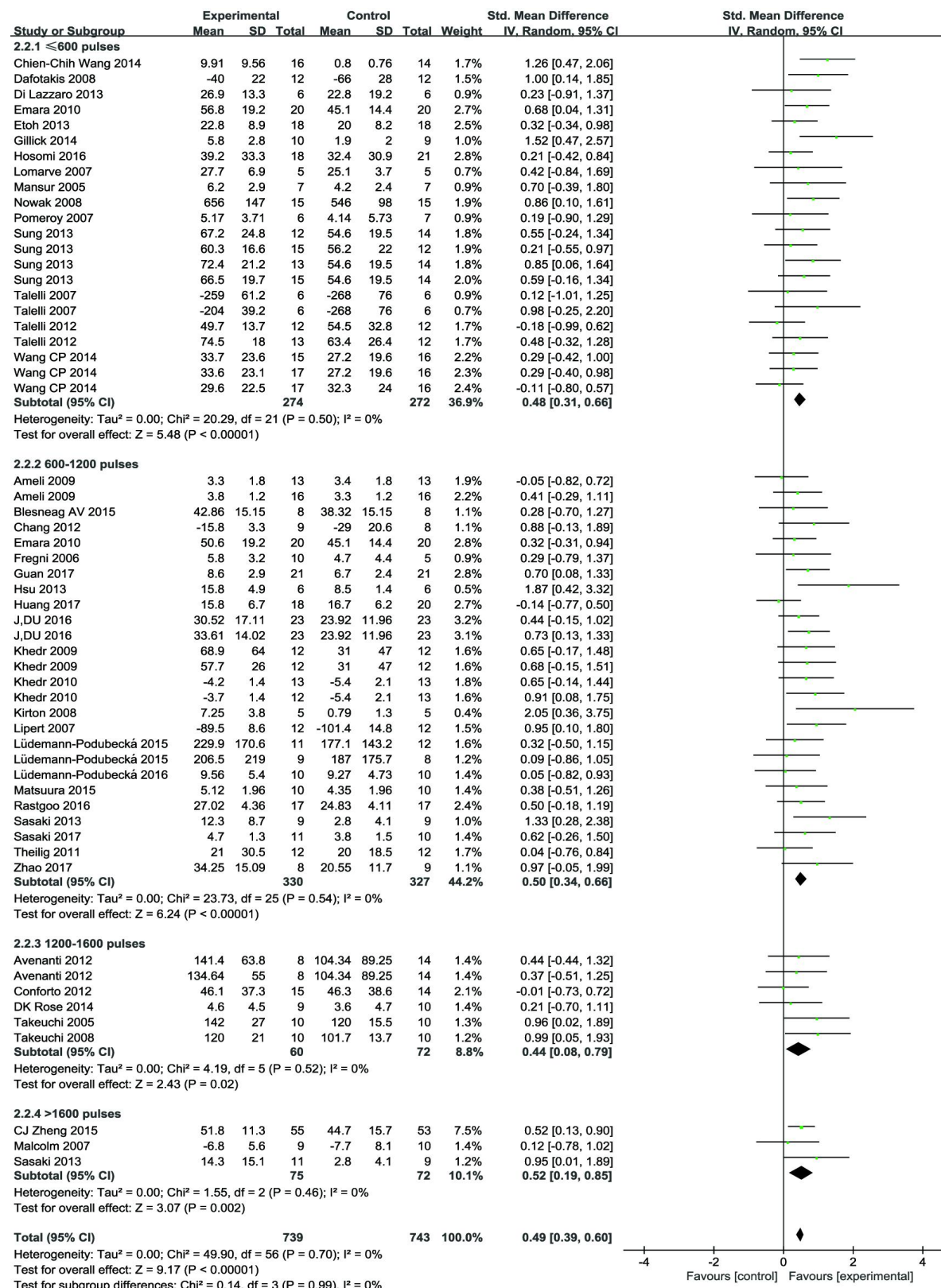
Fig S4. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation pulses rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S5. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation frequency rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S6. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sessions rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S7. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sites rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Fig S8. Forest plot from the meta-analysis of rTMS on limb motor function showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Fig S9. Forest plot from the meta-analysis of rTMS on motor evoked potentials showing estimates of effect size (SMD) with 95% confidence intervals after the

removal of the cross-over study.
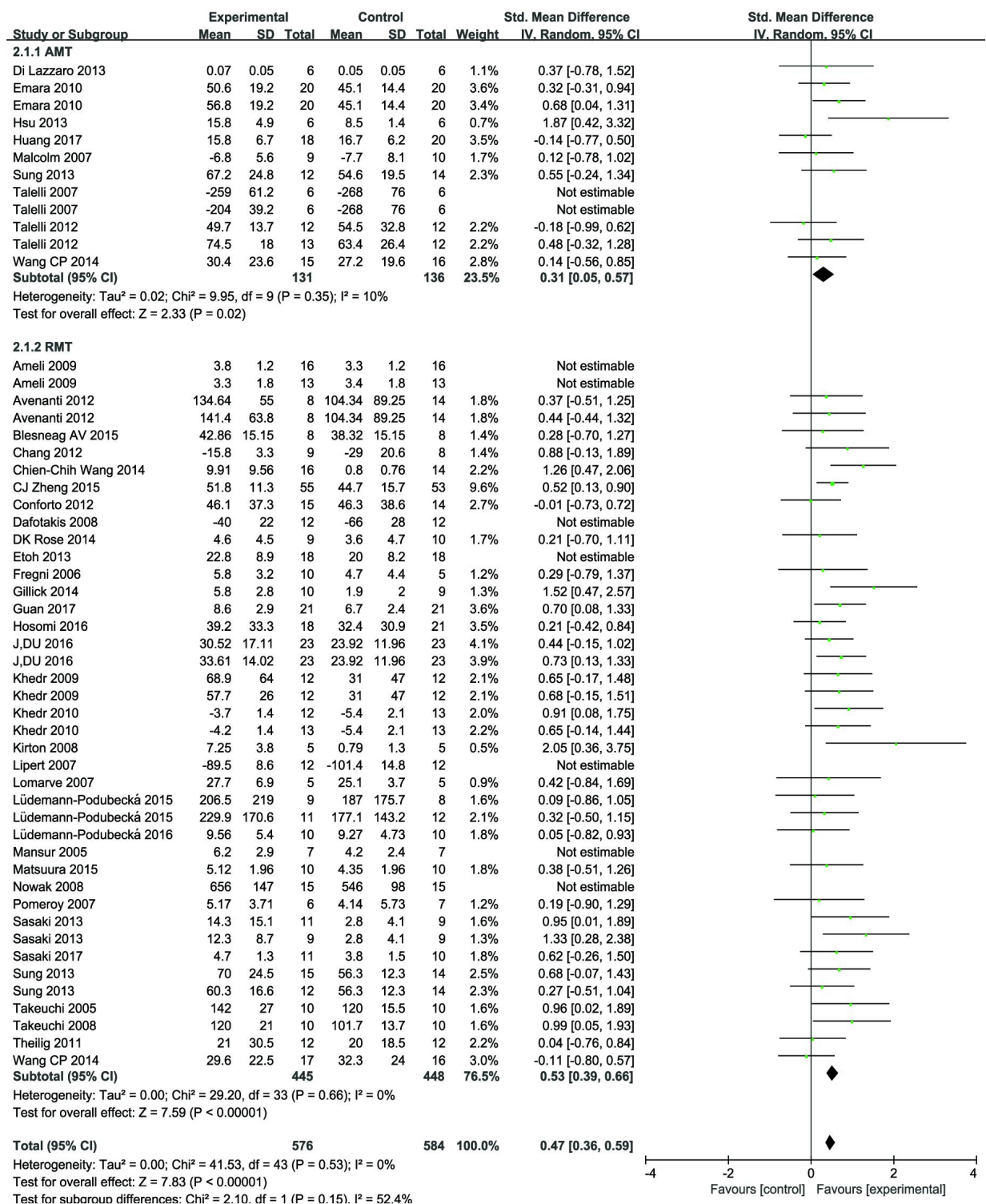
Fig S10. Forest plot from the meta-analysis of rTMS on limb motor function for studies   comparing active motor threshold and resting motor threshold rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
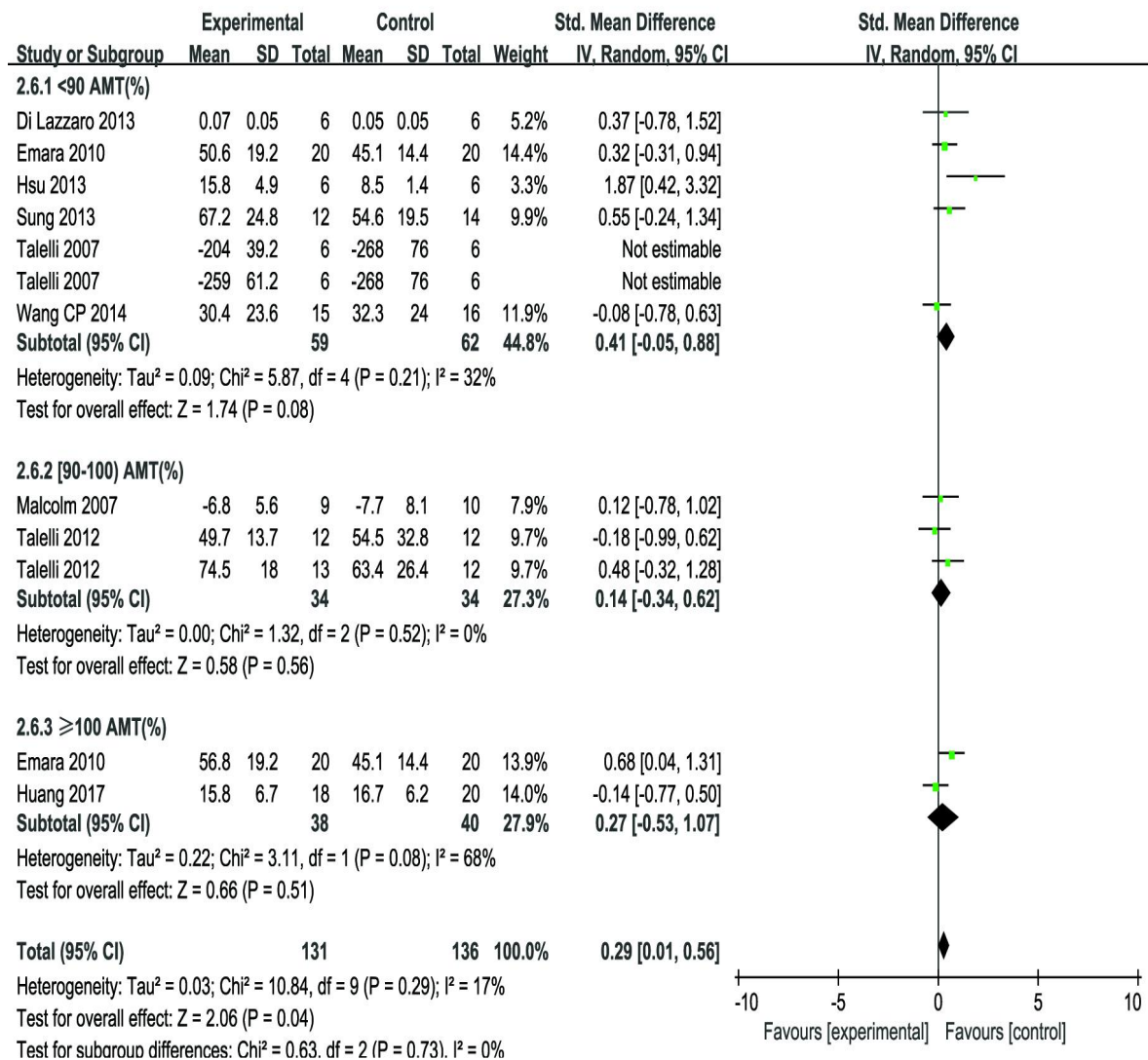
Fig S11. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different active motor threshold (AMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
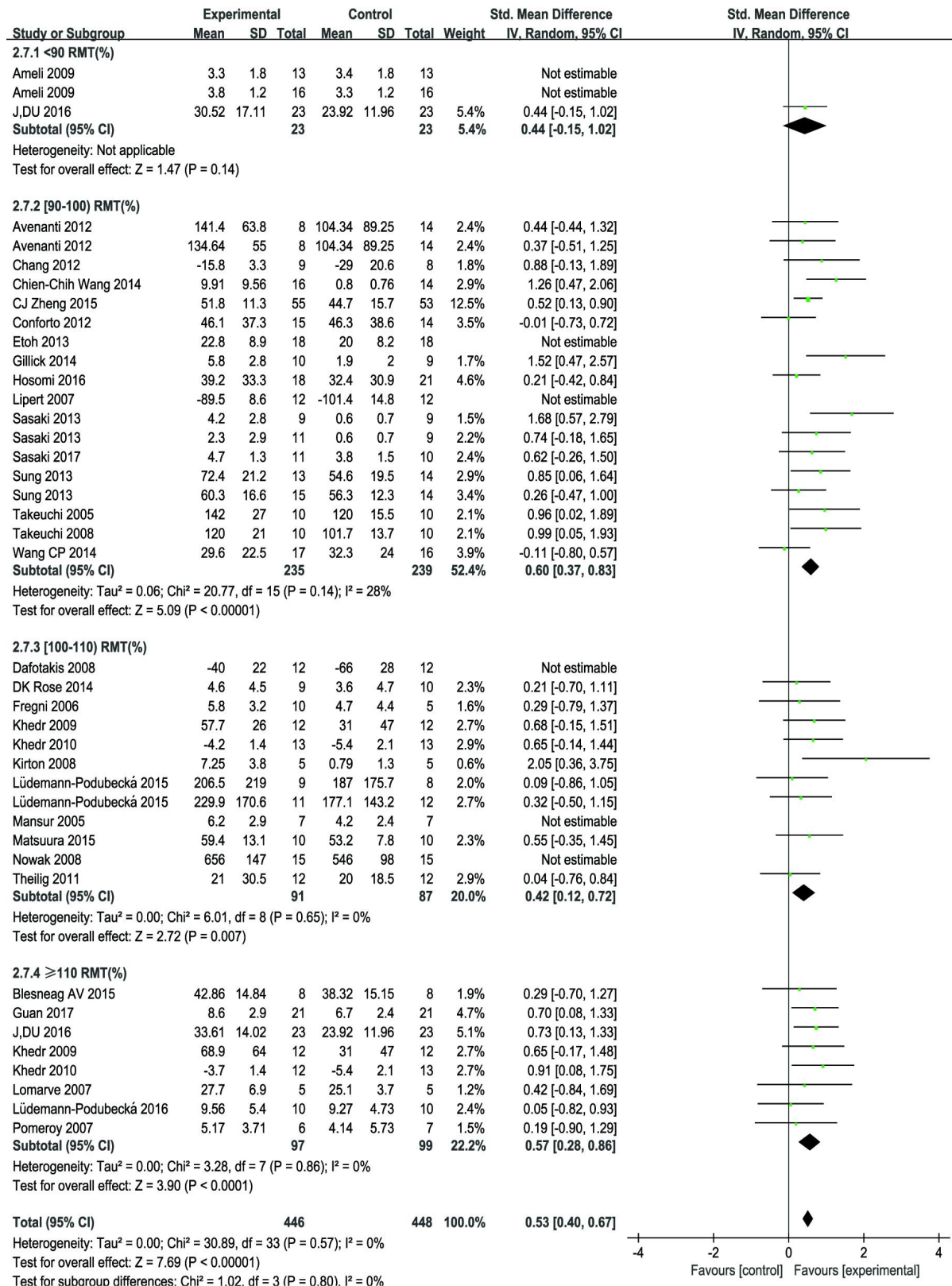
Fig S12. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different resting motor threshold (RMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
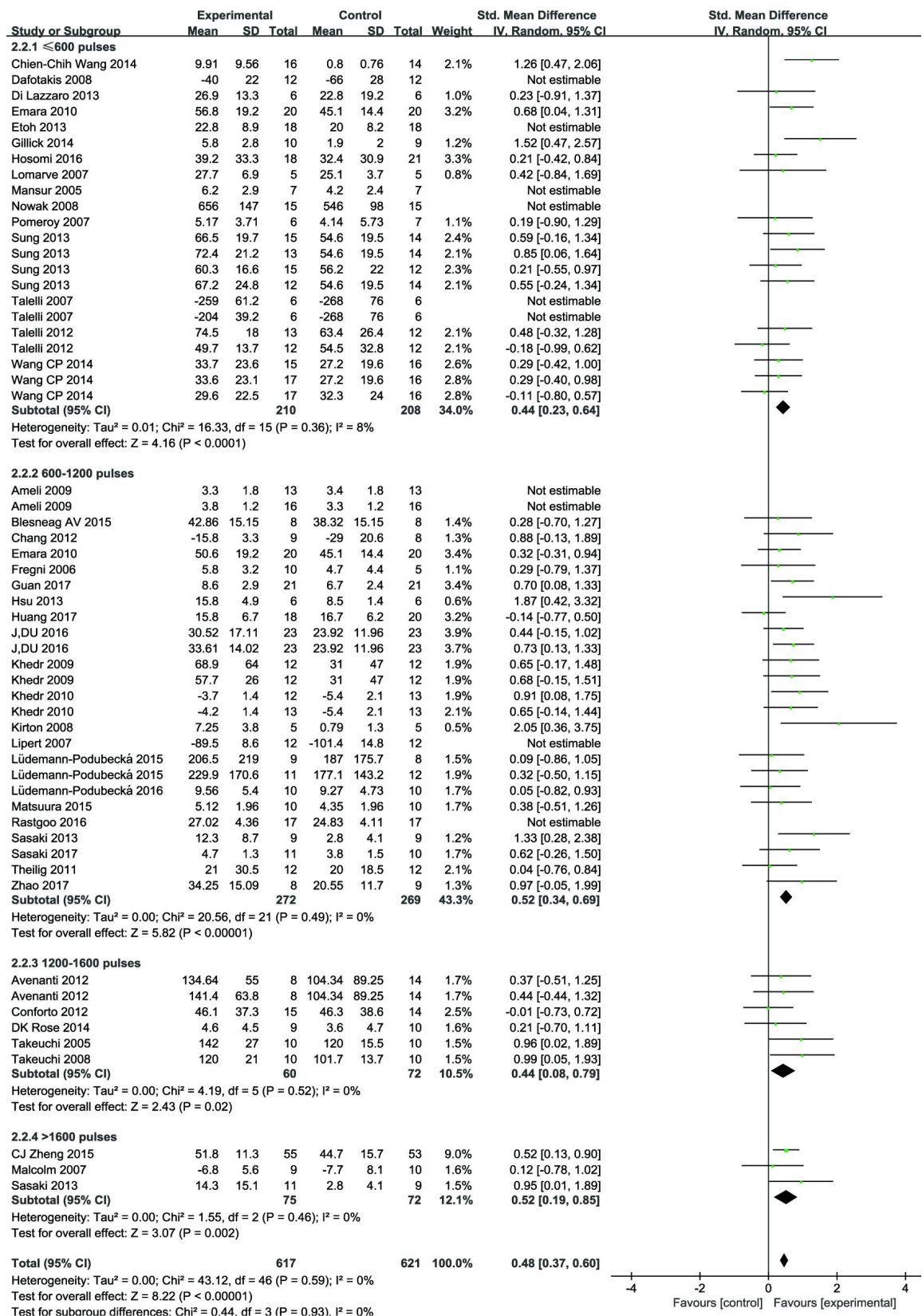
Fig S13. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation pulses rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
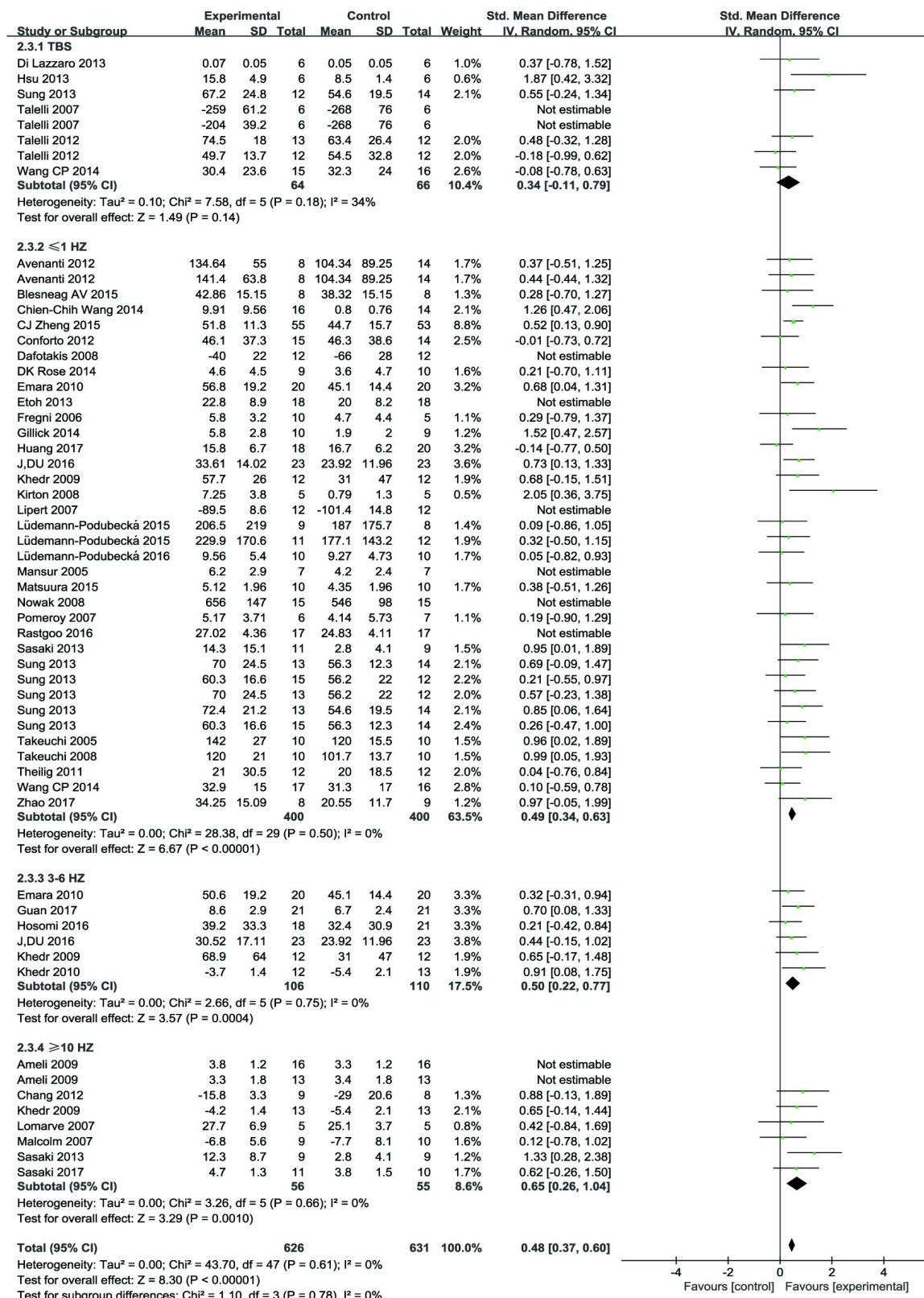
Fig S14. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation frequency rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
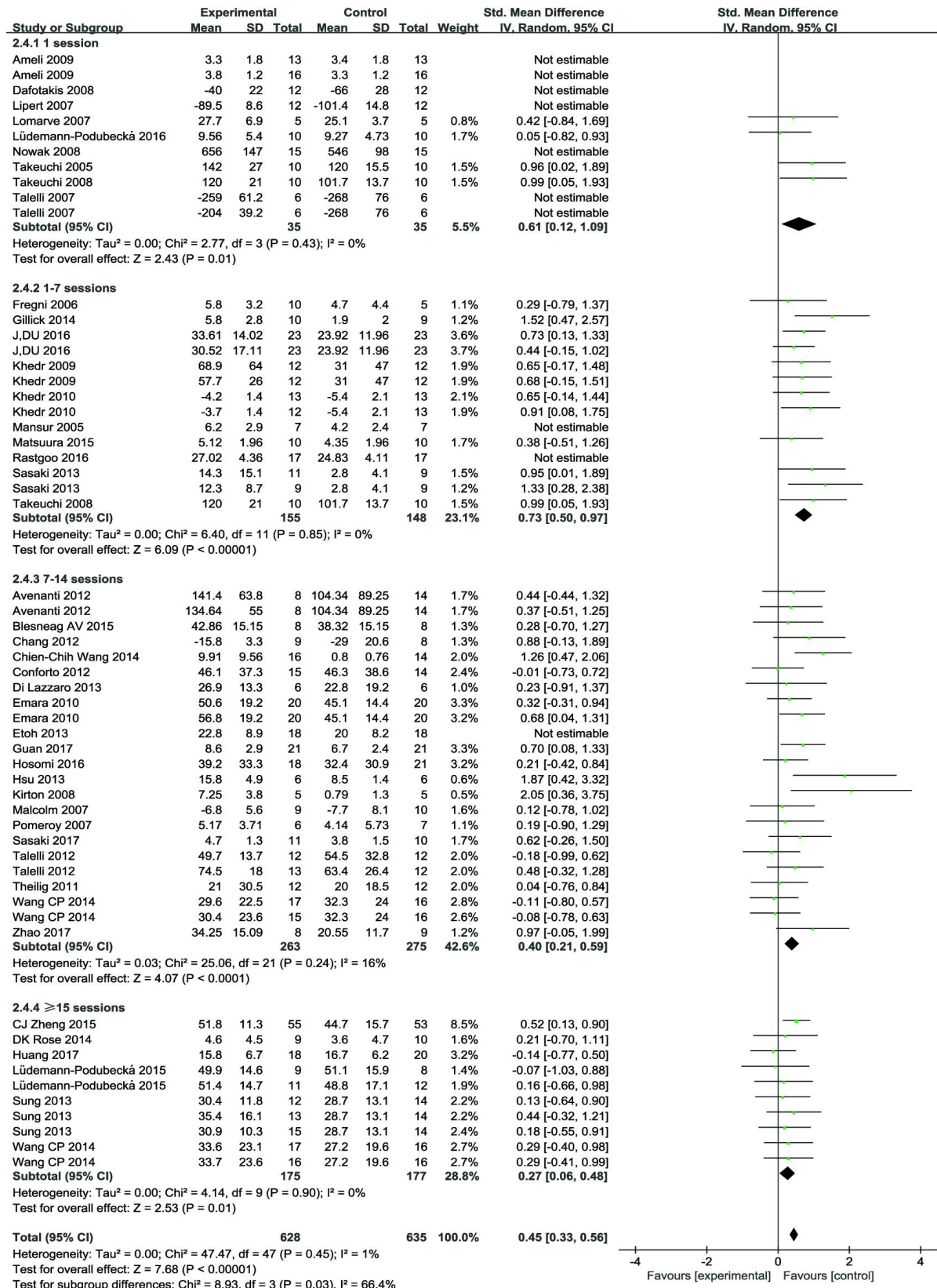
Fig S15. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sessions rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
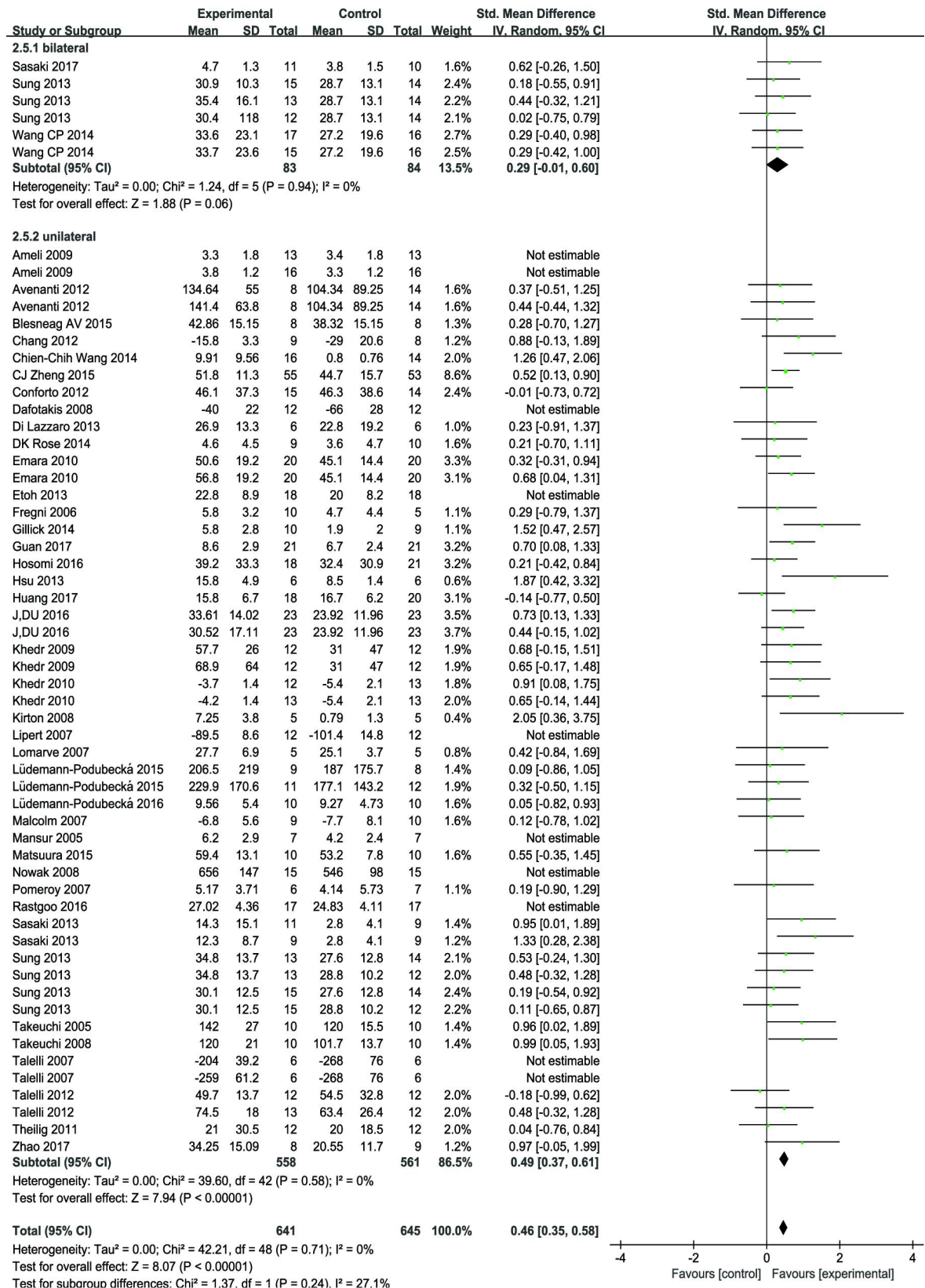
Fig S16. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sites rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.
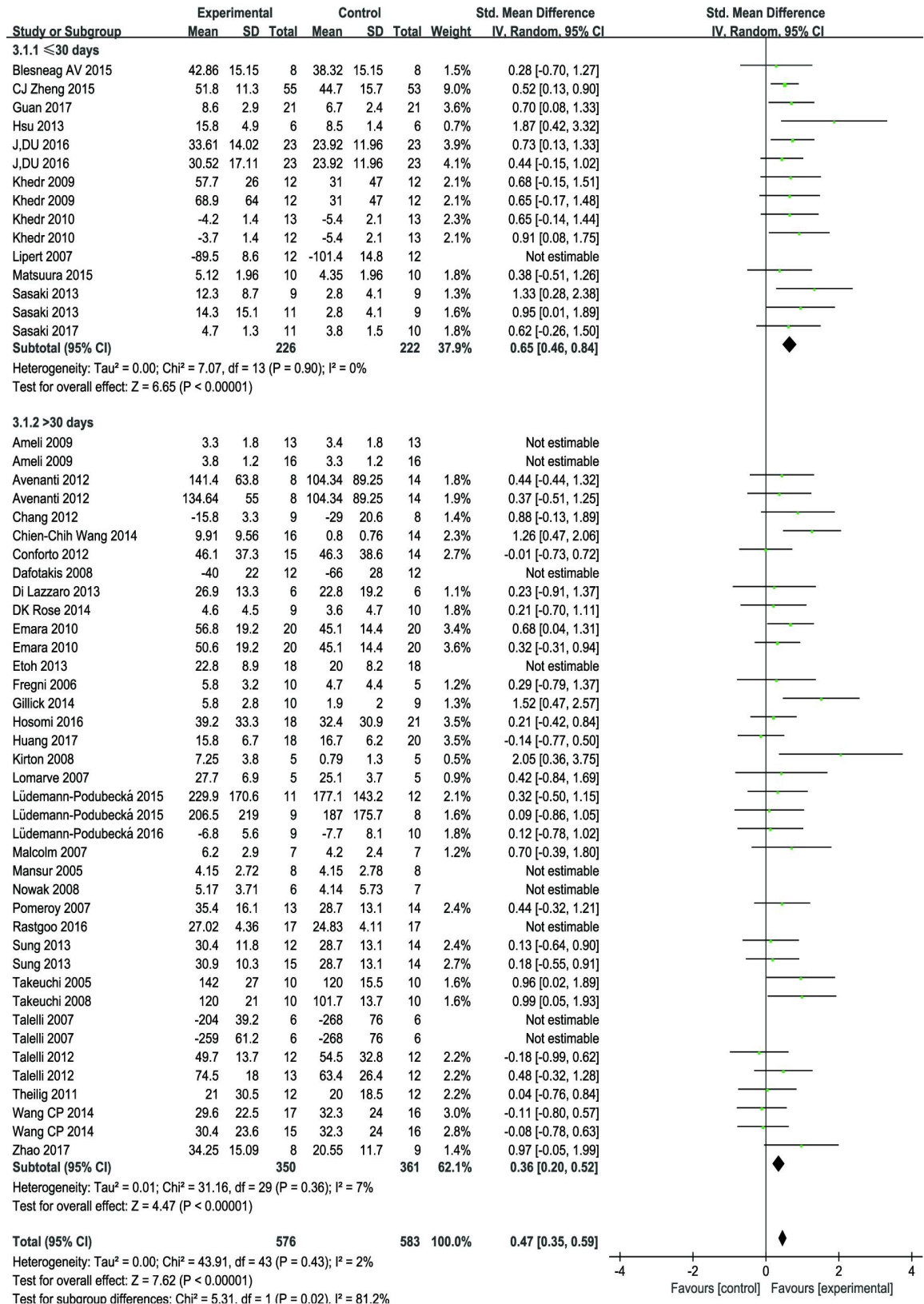
Fig S17. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing early stroke(within 30 days) and chronic stroke(>30 days) showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Fig S18. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing pure subcortical stroke and including cortical stroke showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Supplementary materials

Appendix:

Literature search strategy used for the PubMed database.

#1 Patient

"Stroke" [Abstract] OR "Strokes" OR "Cerebrovascular Accident" OR "Cerebrovascular Accidents" OR "Cerebrovascular Stroke" OR "Cerebrovascular Strokes" OR "Stroke,Cerebrovascular" OR "Strokes, Cerebrovascular" OR "Cerebral Stroke" OR "Cerebral Strokes"

#2 Intervention

"Transcranial magnetic stimulation" [Abstract] OR "Transcranial Magnetic Stimulations"OR "rTMS" OR "repetitive transcranial magnetic stimulation"

#3 Type of study

#3) Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized controlled trials[mh] OR clinical trial[pt] OR clinical trials[mh] OR ("clinical trial" [tw]) OR cross-over studies[mh] OR control*[tw] OR prospectiv*[tw] OR volunteer*[tw] OR crossover studies [mh]

Search #1 and #2 and #3

Publication date: January 2005 and December 2018

TABLE 1 *characteristics of the included studies*

Study	N	stroke time	stroke age (years)	frequency (hertz)	a(r)MT(%)	Pulses	Sessions	Outcome	Location
J.Du2016	23/23/23	3-30d	53.61±13.55	1/3	110-120 R/80-90 R	1200	5	FMA,BI,MEP	cortex/sub-cortex
Lüdemann Podubecká2016	10/10	30±7.5d	71.9±7.9	1	110 R	900	1	JHFT, rMT, MEP	cortex/sub-cortex
Kirton2008	5/5	6.33y	10.08-16.78	1	100 R	1200	8	MAUEF	sub-cortex
Conforto2012	15/14	5-45d	54.8±11.7/56.7±14.8	1	90 R	1500	10	JTT	cortex/sub-cortex
Sasaki2013	9/11/9	6-29d	65±10	10/1	90 R	1000/ 1800	5	TF	cortex/sub-cortex
Talelli2012	13/12/12/12	>1y	54.4±15.8/59.4±12.4	TBS	90 A	600	10	JTT	cortex/sub-cortex
Chang2012	9/8	>3m	58.1/59.5	10	90 R	1000	10	JHFT	cortex/sub-cortex
Hsu2013	6/6	2-4w	54.8±11.7/62.3±8.5	TBS	80 A	1200	10	MEP, FMA	cortex/sub-cortex
Sung2013	15/12/13/14	3-12 m	35-85	1/TBS	90 R/80 A	600	20	FMA, WMFT,FT	cortex/sub-cortex
Etoh2013	9/9	5-60m	59.7±11	1	90 R	240	10	FMA	cortex/sub-cortex
Gillick2014	10/9	congenital	8-17	1	90 R	600	5	AHA	cortex/sub-cortex
DiLazzaro2013	6/6	>1y	59.5±12.4/ 57.5±12.3	TBS	80 A	600	10	JTT	cortex/sub-cortex
Ackerley2014	12/12	≥6m	69±8	TBS	90 A	600	1	PPT	cortex/sub-cortex
CC Wang2014	16/14/14	3-12m	62.38±12.09/68.00±12.51	1	90 R	600	10	FMA	cortex/sub-cortex
Lüdemann Podubecká2015	11/12/9/8	≥6m	68.3±10.8/65.7±9.9	1	100 R	900	15	WMFT, FT	cortex/sub-cortex
CJ Zheng2015	55/53	1-4w	65.4±13.5/66.2 ±13.1	1	90 R	1800	24	FMA, MEP	cortex/sub-cortex
Matsuura2015	10/10	4-21d	72.2±6.0/74.7±12.7	1	100 R	1200	5	FMA, MEP	sub-cortex
Blesneag AV2015	8/8	10d	69±5.8/69.13±7.2	1	120 R	1200	10	FMA,MEP	cortex/sub-cortex
Avenanti A2012	8/8/14	>6m	60.9±8.8/64±7.7/64±12.1	1	90 R	1500	10	JHFT, rMT	cortex/sub-cortex
DKRose2014	9/10	>6m	64.7±7.0	1	100R	1200	16	FMA	/
WangCP2014	17/15/16	2-6m	62.2±12/-62.5±13.4	1/TBS	90R/80A	600	10	FMA, MEP,rMT	cortex/sub-cortex
Emara2010	20/20/20	>1m	50.9±10.3-55.9±6.1	1/5	110-120/80-90R	150/750	10	FT, AI	cortex/sub-cortex
Lomarev2007	7	1-5y	35-65	20	120 R	160	1	PF, MEP	cortex/sub-cortex
Mansur2005	7	12m	37-73	1	100 R	600	2	PPT	cortex/sub-cortex
Ameli2009	13/16	1-88w	56±13	10	80 R	1000	1	FT	cortex/sub-cortex
Dafotakis2008	12/12	>1m	45±9	1	100 R	600	2	GP	sub-cortex
Fregni2006	10/5	>1y	56±11.5	1	100 R	1200	5	PPT	cortex/sub-cortex
Khedr2009	12/12/12	7-20d	57.9±11	1/3	130/100 R	900	5	BI, MEP,KT	cortex/sub-cortex
Khedr2010	12/13/13	5-15d	59.52±13.1	3/10	130/100 R	750	5	HG, MEP	cortex/sub-cortex
Liepert2007	6/6	<14d	63±11	1	90 R	1200	1	NHPT	sub-cortex
Malcolm2007	9/10	>1y	68.4 ± 8.4/65.7 ± 5.1	20	90 A	2000	10	WMFT	cortex/sub-cortex
Pomeroy2007	6/7	1-12w	41-95	1	120 R	200	8	ARAT	cortex/sub-cortex
Takeuchi2005	10/10	≥6m	59.0±9.6	1	90 R	1500	1	PC, rMT	sub-cortex
Takeuchi2008	10/10	≥6m	61.2±9.7/63.4±7.4	1	90 R	1500	1	PC, rMT	sub-cortex
Talelli2007	6/6	>1y	61.2±13.6	TBS	80 A	600	1	SRT	cortex/sub-cortex
Theilig2011	12/12	2w-58m	61±13	1	100 R	900	10	WMFT,MEP	cortex/sub-cortex
Nowak2008	15/15	1-4m	46±8	1	100 R	600	1	Wrist Velocity	sub-cortex
Hosomi2016	18/21	8w	62.9±13.8	5	90 R	500	10	FMA	cortex/sub-cortex
Sasaki2017	11/10	11.2±7.3d	61.4±13.7	10	90 R	1000	10	BRS	sub-cortex
Guan2017	21/21	4.6±3.7d	58.5±11.1	5	120 R	1000	10	BI,FMA	sub-cortex
Huang2017	18/20	10-90d	62.2±10.4/61.2±9.4	1	120 A	900	15	BI,FMA	cortex/sub-cortex
Zhao2017	8/9	1.1±0.77/1.6±0.81m	52.7±12.3/50.5±13	1	70	1200	14	FMA	/
Rastgoo2016	17/17	>6m	54.6±11.7/49.7±11	1	90	1000	5	FMA	cortex/sub-cortex

JTT=Jebsen-Taylor-Test, **JHFT**=Jebsen hand function test, **MEP**=motor evoked potential,**WMFT**=Wolf Motor Function Test, **BI**=Barthel Index, **KT**=keyboard tapping, **aMT**=active motor threshold, **rMT**=rest motor threshold, **FT**=finger-tapping, **AI**=Activity Index, **PF**=pinch force **GP**=grip force, **HG**=hand grip, **PPT**=Purdue Pegboard Test,**TF**=tapping frequency, **NHPT**=Nine Hole Peg Test, **ARAT**=Action Research Arm Test, **PC**=pinch acceleration, **SRT**=simple reaction time, **FMA**=Fugl-Meyer Assessment,**AHA**=Assisting Hand Assessment, **MAUEF**=Melbourne assessment of upper extremity function,**TBS**=theta burst stimulation,y=year,m=month,w=week,d=day

TABLE 2 *PEDro scores of included articles*

Study	1[a]	2	3	4	5	6	7	8	9	10	11	total score(10)	Quality
J.Du2016	Y	1	1	1	1	0	1	1	1	1	1	9	High
Lüdemann-Podubecká2016	Y	1	1	1	1	1	1	1	1	1	1	10	High
Lüdemann-Podubecká2015	Y	1	1	1	1	1	1	1	1	1	1	10	High
WangCP2014	Y	1	1	1	1	1	1	1	1	1	1	10	High
CC Wang2014	Y	1	1	1	1	0	1	1	1	1	1	9	High
DKRose2014	Y	1	1	1	0	1	1	1	1	1	1	9	High
Sung2013	Y	1	1	1	1	1	1	1	1	1	1	10	High
Conforto2012	Y	1	1	1	1	1	1	1	1	1	1	10	High
Emara2010	Y	1	1	1	1	0	1	1	1	1	1	9	High
Khedr2010	Y	1	1	1	1	0	1	1	1	1	1	9	High
Khedr2009	Y	1	1	1	1	0	1	1	1	1	1	9	High
Pomeroy2007	Y	1	1	1	1	0	1	1	1	1	1	9	High
Fregni2006	Y	1	1	1	0	0	0	1	1	1	1	7	High
Guan2017	Y	1	1	1	1	1	1	1	1	1	1	10	High
Sasaki2013	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Talelli2012	Y	0	0	1	1	1	0	1	1	1	1	7	Moderate
Chang2012	Y	1	0	1	1	0	0	1	1	1	1	7	Moderate
Hsu2013	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Etoh2013	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Gillick2014	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
DiLazzaro2013	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Ackerley2014	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
CJ Zheng2015	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Matsuura2015	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Blesneag 2015	Y	1	0	1	0	0	1	1	1	1	1	7	Moderate
Avenanti 2012	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Lomarev2007	Y	1	0	0	0	0	0	0	1	1	1	4	Moderate
Mansur2005	Y	1	0	1	0	0	1	1	1	1	1	7	Moderate
Liepert2007	Y	0	0	1	1	0	1	1	1	1	1	7	Moderate
Malcolm2007	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Takeuchi2005	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Takeuchi2008	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Talelli2007	Y	1	0	1	1	0	0	1	1	1	1	7	Moderate
Theilig2011	Y	1	0	1	1	0	1	1	1	1	1	8	Moderate
Nowak2008	Y	1	0	1	0	0	0	1	1	1	1	6	Moderate
Ameli2009	Y	1	0	1	1	0	0	1	1	1	1	7	Moderate
Dafotakis2008	Y	1	0	1	1	0	0	1	1	1	1	7	Moderate
Kirton2008	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Hosomi2016	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Sasaki2017	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Huang2017	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Zhao2017	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate
Rastgoo2016	Y	1	0	1	1	1	1	1	1	1	1	9	Moderate

[a]Not included in total score.

Y,yes;1,eligibility criteria;2,random allocation;3,concealed allocation; 4,similar groups at baseline; 5,blinding subjects; 6,blinding therapists; 7,blinding assessors; 8,outcome obtained in more than 85% of the subjects;9,intention-to-treat analysis;10,between-group statistical comparison;11, point estimates and measures of variability.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.2.1 Low frequency								
J,DU 2016	1.89	1.11	23	2.68	0.89	23	11.9%	-0.77 [-1.37, -0.17]
Khedr 2009	2.8	1.2	12	3.6	1.3	12	7.8%	-0.62 [-1.44, 0.21]
Lüdemann-Podubecká 2015	1.01	0.37	11	0.84	0.64	12	7.8%	0.31 [-0.51, 1.13]
Lüdemann-Podubecká 2015	0.85	0.39	9	1.45	1.25	8	6.0%	-0.63 [-1.62, 0.35]
Lüdemann-Podubecká 2016	0.74	0.5	10	0.63	0.43	10	7.1%	0.23 [-0.65, 1.11]
Matsuura 2015	9.19	3.57	10	7.01	2.56	10	6.8%	0.67 [-0.23, 1.58]
Sung 2013	2.2	1.4	13	3.3	1.3	12	7.9%	-0.79 [-1.61, 0.03]
Sung 2013	2.5	1.3	15	3.3	1.3	12	8.5%	-0.60 [-1.38, 0.18]
Sung 2013	2.2	1.4	13	2.9	1.2	14	8.6%	-0.52 [-1.29, 0.25]
Sung 2013	2.5	1.3	15	2.9	1.2	14	9.2%	-0.31 [-1.04, 0.42]
Theilig 2011	0.98	0.56	12	1.04	0.44	12	8.2%	-0.12 [-0.92, 0.69]
Wang CP 2014	4.4	3.4	17	3.9	2.6	16	10.1%	0.16 [-0.52, 0.84]
Subtotal (95% CI)			160			155	100.0%	-0.27 [-0.54, -0.00]
1.2.2 High frequency								
Ackerley 2014	0.68	0.08	12	0.58	0.1	12	11.7%	1.07 [0.20, 1.93]
Ackerley 2014	0.66	0.11	12	0.58	0.1	12	12.5%	0.73 [-0.10, 1.57]
Hsu 2013	0.06	0.13	5	0.06	0.07	4	5.6%	0.00 [-1.31, 1.31]
J,DU 2016	1.81	1.09	23	1.34	0.73	23	20.9%	0.50 [-0.09, 1.09]
Khedr 2009	2.8	1.5	9	2.3	1.2	8	9.8%	0.35 [-0.61, 1.31]
Khedr 2010	1.1	1.1	11	1.1	1.1	5	8.3%	0.00 [-1.06, 1.06]
Lomarve 2007	338	63	5	153	26	5	1.9%	3.47 [1.15, 5.78]
Sung 2013	2	1.8	12	1.4	1	14	13.8%	0.41 [-0.37, 1.19]
Wang CP 2014	2.3	2.7	15	0.9	1.8	16	15.5%	0.60 [-0.12, 1.32]
Subtotal (95% CI)			104			99	100.0%	0.57 [0.24, 0.90]

Heterogeneity (Low frequency): Tau² = 0.06; Chi² = 15.43, df = 11 (P = 0.16); I² = 29%
Test for overall effect: Z = 1.98 (P = 0.05)

Heterogeneity (High frequency): Tau² = 0.04; Chi² = 9.72, df = 8 (P = 0.29); I² = 18%
Test for overall effect: Z = 3.42 (P = 0.0006)

Test for subgroup differences: Chi² = 15.17, df = 1 (P < 0.0001), I² = 93.4%

Fig S1. Forest plot from the meta-analysis of rTMS on motor evoked potentials showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
2.6.1 <90 AMT(%)									
Di Lazzaro 2013	0.07	0.05	6	0.05	0.05	6	4.5%	0.37 [-0.78, 1.52]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	13.5%	0.32 [-0.31, 0.94]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	2.8%	1.87 [0.42, 3.32]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	9.0%	0.55 [-0.24, 1.34]	
Talelli 2007	-204	39.2	6	-268	76	6	3.9%	0.98 [-0.25, 2.20]	
Talelli 2007	-259	61.2	6	-268	76	6	4.6%	0.12 [-1.01, 1.25]	
Wang CP 2014	30.4	23.6	15	32.3	24	16	11.0%	-0.08 [-0.78, 0.63]	
Subtotal (95% CI)			71			74	49.4%	0.41 [0.04, 0.78]	

Heterogeneity: Tau² = 0.04; Chi² = 6.98, df = 6 (P = 0.32); I² = 14%
Test for overall effect: Z = 2.17 (P = 0.03)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.6.2 [90-100) AMT(%)									
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	7.0%	0.12 [-0.78, 1.02]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	8.7%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	8.8%	0.48 [-0.32, 1.28]	
Subtotal (95% CI)			34			34	24.6%	0.14 [-0.34, 0.62]	

Heterogeneity: Tau² = 0.00; Chi² = 1.32, df = 2 (P = 0.52); I² = 0%
Test for overall effect: Z = 0.58 (P = 0.56)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.6.3 ⩾100 AMT(%)									
Emara 2010	56.8	19.2	20	45.1	14.4	20	13.0%	0.68 [0.04, 1.31]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	13.1%	-0.14 [-0.77, 0.50]	
Subtotal (95% CI)			38			40	26.1%	0.27 [-0.53, 1.07]	

Heterogeneity: Tau² = 0.22; Chi² = 3.11, df = 1 (P = 0.08); I² = 68%
Test for overall effect: Z = 0.66 (P = 0.51)

| Total (95% CI) | | | 143 | | | 148 | 100.0% | 0.30 [0.05, 0.55] | |

Heterogeneity: Tau² = 0.02; Chi² = 12.13, df = 11 (P = 0.35); I² = 9%
Test for overall effect: Z = 2.38 (P = 0.02)
Test for subgroup differences: Chi² = 0.77, df = 2 (P = 0.68), I² = 0%

Favours [experimental] Favours [control]
-10 -5 0 5 10

Fig S2. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different active motor threshold (AMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.7.1 <90 RMT(%)								
Ameli 2009	3.8	1.2	16	3.3	1.2	16	3.1%	0.41 [-0.29, 1.11]
Ameli 2009	3.3	1.8	13	3.4	1.8	13	2.6%	-0.05 [-0.82, 0.72]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	4.4%	0.44 [-0.15, 1.02]
Subtotal (95% CI)			52			52	10.1%	0.30 [-0.08, 0.69]
Heterogeneity: Tau² = 0.00; Chi² = 1.12, df = 2 (P = 0.57); I² = 0%								
Test for overall effect: Z = 1.53 (P = 0.13)								
2.7.2 [90-100) RMT(%)								
Avenanti 2012	134.64	55	8	104.34	89.25	14	2.0%	0.37 [-0.51, 1.25]
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	2.0%	0.44 [-0.44, 1.32]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.5%	0.88 [-0.13, 1.89]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.4%	1.26 [0.47, 2.06]
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	10.4%	0.52 [0.13, 0.90]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.9%	-0.01 [-0.73, 0.72]
Etoh 2013	22.8	8.9	18	20	8.2	18	3.5%	0.32 [-0.34, 0.98]
Gillick 2014	5.8	2.8	10	1.9	2	9	1.4%	1.52 [0.47, 2.57]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.8%	0.21 [-0.42, 0.84]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12	2.1%	0.95 [0.10, 1.80]
Sasaki 2013	2.3	2.9	11	0.6	0.7	9	1.8%	0.74 [-0.18, 1.65]
Sasaki 2013	4.2	2.8	9	0.6	0.7	9	1.2%	1.68 [0.57, 2.79]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	2.0%	0.62 [-0.26, 1.50]
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.4%	0.85 [0.06, 1.64]
Sung 2013	60.3	16.6	15	56.3	12.3	14	2.8%	0.26 [-0.47, 1.00]
Takeuchi 2005	142	27	10	120	15.5	10	1.7%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.7%	0.99 [0.05, 1.93]
Wang CP 2014	29.6	22.5	17	32.3	24	16	3.3%	-0.11 [-0.80, 0.57]
Subtotal (95% CI)			265			269	48.9%	0.59 [0.38, 0.80]
Heterogeneity: Tau² = 0.05; Chi² = 22.08, df = 17 (P = 0.18); I² = 23%								
Test for overall effect: Z = 5.56 (P < 0.00001)								
2.7.3 [100-110) RMT(%)								
Dafotakis 2008	-40	22	12	-66	28	12	2.1%	1.00 [0.14, 1.85]
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.9%	0.21 [-0.70, 1.11]
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.3%	0.29 [-0.79, 1.37]
Khedr 2009	57.7	26	12	31	47	12	2.2%	0.68 [-0.15, 1.51]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	12	2.4%	0.65 [-0.14, 1.44]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.7%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	2.2%	0.32 [-0.50, 1.15]
Mansur 2005	6.2	2.9	7	4.2	2.4	7	1.3%	0.70 [-0.39, 1.80]
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	1.9%	0.55 [-0.35, 1.45]
Nowak 2008	656	147	15	546	98	15	2.7%	0.86 [0.10, 1.61]
Theilig 2011	21	30.5	12	20	18.5	12	2.4%	0.04 [-0.76, 0.84]
Subtotal (95% CI)			125			121	22.6%	0.54 [0.28, 0.80]
Heterogeneity: Tau² = 0.00; Chi² = 8.46, df = 11 (P = 0.67); I² = 0%								
Test for overall effect: Z = 4.09 (P < 0.0001)								
2.7.4 ≥110 RMT(%)								
Blesneag AV 2015	42.86	14.84	8	38.32	15.15	8	1.6%	0.29 [-0.70, 1.27]
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.9%	0.70 [0.08, 1.33]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	4.3%	0.73 [0.13, 1.33]
Khedr 2009	68.9	64	12	31	47	12	2.2%	0.65 [-0.17, 1.48]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	2.2%	0.91 [0.08, 1.75]
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	1.0%	0.42 [-0.84, 1.69]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	2.0%	0.05 [-0.82, 0.93]
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.3%	0.19 [-0.90, 1.29]
Subtotal (95% CI)			97			99	18.4%	0.57 [0.28, 0.86]
Heterogeneity: Tau² = 0.00; Chi² = 3.28, df = 7 (P = 0.86); I² = 0%								
Test for overall effect: Z = 3.90 (P < 0.0001)								
Total (95% CI)			539			541	100.0%	0.54 [0.41, 0.66]
Heterogeneity: Tau² = 0.00; Chi² = 36.50, df = 40 (P = 0.63); I² = 0%								
Test for overall effect: Z = 8.50 (P < 0.00001)								
Test for subgroup differences: Chi² = 1.72, df = 3 (P = 0.63), I² = 0%								

Favours [control]   Favours [experimental]

Fig S3. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different resting motor threshold (RMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
2.2.1 ≤600 pulses									
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	1.7%	1.26 [0.47, 2.06]	
Dafotakis 2008	-40	22	12	-66	28	12	1.5%	1.00 [0.14, 1.85]	
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	0.9%	0.23 [-0.91, 1.37]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	2.7%	0.68 [0.04, 1.31]	
Etoh 2013	22.8	8.9	18	20	8.2	18	2.5%	0.32 [-0.34, 0.98]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.0%	1.52 [0.47, 2.57]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	2.8%	0.21 [-0.42, 0.84]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.7%	0.42 [-0.84, 1.69]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7	0.9%	0.70 [-0.39, 1.80]	
Nowak 2008	656	147	15	546	98	15	1.9%	0.86 [0.10, 1.61]	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	0.9%	0.19 [-0.90, 1.29]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	1.8%	0.55 [-0.24, 1.34]	
Sung 2013	60.3	16.6	15	56.2	22	12	1.9%	0.21 [-0.55, 0.97]	
Sung 2013	72.4	21.2	13	54.6	19.5	14	1.8%	0.85 [0.06, 1.64]	
Sung 2013	66.5	19.7	15	54.6	19.5	14	2.0%	0.59 [-0.16, 1.34]	
Talelli 2007	-259	61.2	6	-268	76	6	0.9%	0.12 [-1.01, 1.25]	
Talelli 2007	-204	39.2	6	-268	76	6	0.7%	0.98 [-0.25, 2.20]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	1.7%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	1.7%	0.48 [-0.32, 1.28]	
Wang CP 2014	33.7	23.6	15	27.2	19.6	16	2.2%	0.29 [-0.42, 1.00]	
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.3%	0.29 [-0.40, 0.98]	
Wang CP 2014	29.6	22.5	17	32.3	24	16	2.4%	-0.11 [-0.80, 0.57]	
Subtotal (95% CI)			274			272	36.9%	0.48 [0.31, 0.66]	

Heterogeneity: Tau² = 0.00; Chi² = 20.29, df = 21 (P = 0.50); I² = 0%
Test for overall effect: Z = 5.48 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.2.2 600-1200 pulses									
Ameli 2009	3.3	1.8	13	3.4	1.8	13	1.9%	-0.05 [-0.82, 0.72]	
Ameli 2009	3.8	1.2	16	3.3	1.2	16	2.2%	0.41 [-0.29, 1.11]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.1%	0.28 [-0.70, 1.27]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.1%	0.88 [-0.13, 1.89]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	2.8%	0.32 [-0.31, 0.94]	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	0.9%	0.29 [-0.79, 1.37]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	2.8%	0.70 [0.08, 1.33]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.5%	1.87 [0.42, 3.32]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	2.7%	-0.14 [-0.77, 0.50]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.2%	0.44 [-0.15, 1.02]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.1%	0.73 [0.13, 1.33]	
Khedr 2009	68.9	64	12	31	47	12	1.6%	0.65 [-0.17, 1.48]	
Khedr 2009	57.7	26	12	31	47	12	1.6%	0.68 [-0.15, 1.51]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	1.8%	0.65 [-0.14, 1.44]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.6%	0.91 [0.08, 1.75]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.4%	2.05 [0.36, 3.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12	1.5%	0.95 [0.10, 1.80]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.6%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.2%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.4%	0.05 [-0.82, 0.93]	
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.4%	0.38 [-0.51, 1.26]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17	2.4%	0.50 [-0.18, 1.19]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.0%	1.33 [0.28, 2.38]	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.4%	0.62 [-0.26, 1.50]	
Theilig 2011	21	30.5	12	20	18.5	12	1.7%	0.04 [-0.76, 0.84]	
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.1%	0.97 [-0.05, 1.99]	
Subtotal (95% CI)			330			327	44.2%	0.50 [0.34, 0.66]	

Heterogeneity: Tau² = 0.00; Chi² = 23.73, df = 25 (P = 0.54); I² = 0%
Test for overall effect: Z = 6.24 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.2.3 1200-1600 pulses									
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.4%	0.44 [-0.44, 1.32]	
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.4%	0.37 [-0.51, 1.25]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.1%	-0.01 [-0.73, 0.72]	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.4%	0.21 [-0.70, 1.11]	
Takeuchi 2005	142	27	10	120	15.5	10	1.3%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.2%	0.99 [0.05, 1.93]	
Subtotal (95% CI)			60			72	8.8%	0.44 [0.08, 0.79]	

Heterogeneity: Tau² = 0.00; Chi² = 4.19, df = 5 (P = 0.52); I² = 0%
Test for overall effect: Z = 2.43 (P = 0.02)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.2.4 >1600 pulses									
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	7.5%	0.52 [0.13, 0.90]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.4%	0.12 [-0.78, 1.02]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.2%	0.95 [0.01, 1.89]	
Subtotal (95% CI)			75			72	10.1%	0.52 [0.19, 0.85]	

Heterogeneity: Tau² = 0.00; Chi² = 1.55, df = 2 (P = 0.46); I² = 0%
Test for overall effect: Z = 3.07 (P = 0.002)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
Total (95% CI)			739			743	100.0%	0.49 [0.39, 0.60]	

Heterogeneity: Tau² = 0.00; Chi² = 49.90, df = 56 (P = 0.70); I² = 0%
Test for overall effect: Z = 9.17 (P < 0.00001)
Test for subgroup differences: Chi² = 0.14, df = 3 (P = 0.99), I² = 0%

Favours [control]   Favours [experimental]

Fig S4. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation pulses rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
2.3.1 TBS									
Di Lazzaro 2013	0.07	0.05	6	0.05	0.05	6	0.8%	0.37 [-0.78, 1.52]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.5%	1.87 [0.42, 3.32]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	1.8%	0.55 [-0.24, 1.34]	
Talelli 2007	-259	61.2	6	-268	76	6	0.8%	0.12 [-1.01, 1.25]	
Talelli 2007	-204	39.2	6	-268	76	6	0.7%	0.98 [-0.25, 2.20]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	1.7%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	1.7%	0.48 [-0.32, 1.28]	
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.2%	-0.08 [-0.78, 0.63]	
Subtotal (95% CI)			76			78	10.3%	0.36 [-0.02, 0.73]	

Heterogeneity: Tau² = 0.06; Chi² = 8.82, df = 7 (P = 0.27); I² = 21%
Test for overall effect: Z = 1.88 (P = 0.06)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.3.2 ≤1 HZ									
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.4%	0.37 [-0.51, 1.25]	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.4%	0.44 [-0.44, 1.32]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.1%	0.28 [-0.70, 1.27]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	1.7%	1.26 [0.47, 2.06]	
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	7.4%	0.52 [0.13, 0.90]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.1%	-0.01 [-0.73, 0.72]	
Dafotakis 2008	-40	22	12	-66	28	12	1.5%	1.00 [0.14, 1.85]	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.3%	0.21 [-0.70, 1.11]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	2.7%	0.68 [0.04, 1.31]	
Etoh 2013	22.8	8.9	18	20	8.2	18	2.5%	0.32 [-0.34, 0.98]	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	0.9%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.0%	1.52 [0.47, 2.57]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	2.7%	-0.14 [-0.77, 0.50]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.0%	0.73 [0.13, 1.33]	
Khedr 2009	57.7	26	12	31	47	12	1.6%	0.68 [-0.15, 1.51]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.4%	2.05 [0.36, 3.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12	1.5%	0.95 [0.10, 1.80]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.2%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.6%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.4%	0.05 [-0.82, 0.93]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7	0.9%	0.70 [-0.39, 1.80]	
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.4%	0.38 [-0.51, 1.26]	
Nowak 2008	656	147	15	546	98	15	1.9%	0.86 [0.10, 1.61]	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	0.9%	0.19 [-0.90, 1.29]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17	2.3%	0.50 [-0.18, 1.19]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.2%	0.95 [0.01, 1.89]	
Sung 2013	72.4	21.2	13	54.6	19.5	14	1.7%	0.85 [0.06, 1.64]	
Sung 2013	60.3	16.6	15	56.2	22	12	1.9%	0.21 [-0.55, 0.97]	
Sung 2013	70	24.5	13	56.2	22	12	1.7%	0.57 [-0.23, 1.38]	
Sung 2013	70	24.5	13	56.3	12.3	14	1.8%	0.69 [-0.09, 1.47]	
Sung 2013	60.3	16.6	15	56.3	12.3	14	2.0%	0.26 [-0.47, 1.00]	
Takeuchi 2005	142	27	10	120	15.5	10	1.2%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.2%	0.99 [0.05, 1.93]	
Theilig 2011	21	30.5	12	20	18.5	12	1.7%	0.04 [-0.76, 0.84]	
Wang CP 2014	32.9	15	17	31.3	17	16	2.3%	0.10 [-0.59, 0.78]	
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.0%	0.97 [-0.05, 1.99]	
Subtotal (95% CI)			481			481	63.8%	0.52 [0.39, 0.65]	

Heterogeneity: Tau² = 0.00; Chi² = 31.98, df = 35 (P = 0.61); I² = 0%
Test for overall effect: Z = 7.77 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.3.3 3-6 HZ									
Emara 2010	50.6	19.2	20	45.1	14.4	20	2.8%	0.32 [-0.31, 0.94]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	2.8%	0.70 [0.08, 1.33]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	2.7%	0.21 [-0.42, 0.84]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.2%	0.44 [-0.15, 1.02]	
Khedr 2009	68.9	64	12	31	47	12	1.6%	0.65 [-0.17, 1.48]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	12	1.6%	0.91 [0.08, 1.75]	
Subtotal (95% CI)			106			110	14.7%	0.50 [0.22, 0.77]	

Heterogeneity: Tau² = 0.00; Chi² = 2.66, df = 5 (P = 0.75); I² = 0%
Test for overall effect: Z = 3.57 (P = 0.0004)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
2.3.4 ≥10 HZ									
Ameli 2009	3.3	1.8	13	3.4	1.8	13	1.8%	-0.05 [-0.82, 0.72]	
Ameli 2009	3.8	1.2	16	3.3	1.2	16	2.2%	0.41 [-0.29, 1.11]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.1%	0.88 [-0.13, 1.89]	
Khedr 2009	-4.2	1.4	13	-5.4	2.1	13	1.7%	0.65 [-0.14, 1.44]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.7%	0.42 [-0.84, 1.69]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.3%	0.12 [-0.78, 1.02]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.0%	1.33 [0.28, 2.38]	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.4%	0.62 [-0.26, 1.50]	
Subtotal (95% CI)			85			84	11.3%	0.49 [0.18, 0.80]	

Heterogeneity: Tau² = 0.00; Chi² = 5.91, df = 7 (P = 0.55); I² = 0%
Test for overall effect: Z = 3.08 (P = 0.002)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	
Total (95% CI)			748			753	100.0%	0.49 [0.39, 0.60]	

Heterogeneity: Tau² = 0.00; Chi² = 50.48, df = 57 (P = 0.72); I² = 0%
Test for overall effect: Z = 9.25 (P < 0.00001)
Test for subgroup differences: Chi² = 0.64, df = 3 (P = 0.89), I² = 0%

Favours [control] Favours [experimental]

Fig S5. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation frequency rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
2.4.1 1 session									
Ameli 2009	3.3	1.8	13	3.4	1.8	13	1.8%	-0.05 [-0.82, 0.72]	
Ameli 2009	3.8	1.2	16	3.3	1.2	16	2.2%	0.41 [-0.29, 1.11]	
Dafotakis 2008	-40	22	12	-66	28	12	1.5%	1.00 [0.14, 1.85]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12	1.5%	0.95 [0.10, 1.80]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.7%	0.42 [-0.84, 1.69]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.4%	0.05 [-0.82, 0.93]	
Nowak 2008	656	147	15	546	98	15	1.9%	0.86 [0.10, 1.61]	
Takeuchi 2005	142	27	10	120	15.5	10	1.2%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.2%	0.99 [0.05, 1.93]	
Talelli 2007	-259	61.2	6	-268	76	6	0.8%	0.12 [-1.01, 1.25]	
Talelli 2007	-204	39.2	6	-268	76	6	0.7%	0.98 [-0.25, 2.20]	
Subtotal (95% CI)			115			115	15.0%	0.59 [0.32, 0.86]	
Heterogeneity: Tau² = 0.00; Chi² = 8.81, df = 10 (P = 0.55); I² = 0%									
Test for overall effect: Z = 4.31 (P < 0.0001)									
2.4.2 1-7 sessions									
Fregni 2006	5.8	3.2	10	4.7	4.4	5	0.9%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.0%	1.52 [0.47, 2.57]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.2%	0.44 [-0.15, 1.02]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.0%	0.73 [0.13, 1.33]	
Khedr 2009	57.7	26	12	31	47	12	1.6%	0.68 [-0.15, 1.51]	
Khedr 2009	68.9	64	12	31	47	12	1.6%	0.65 [-0.17, 1.48]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.6%	0.91 [0.08, 1.75]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	1.7%	0.65 [-0.14, 1.44]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7	0.9%	0.70 [-0.39, 1.80]	
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.4%	0.38 [-0.51, 1.26]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17	2.3%	0.50 [-0.18, 1.19]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.0%	1.33 [0.28, 2.38]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.2%	0.95 [0.01, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.2%	0.99 [0.05, 1.93]	
Subtotal (95% CI)			179			172	22.6%	0.71 [0.49, 0.93]	
Heterogeneity: Tau² = 0.00; Chi² = 6.78, df = 13 (P = 0.91); I² = 0%									
Test for overall effect: Z = 6.35 (P < 0.00001)									
2.4.3 7-14 sessions									
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.4%	0.37 [-0.51, 1.25]	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.4%	0.44 [-0.44, 1.32]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.1%	0.28 [-0.70, 1.27]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.1%	0.88 [-0.13, 1.89]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	1.7%	1.26 [0.47, 2.06]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.0%	-0.01 [-0.73, 0.72]	
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	0.8%	0.23 [-0.91, 1.37]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	2.6%	0.68 [0.04, 1.31]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	2.8%	0.32 [-0.31, 0.94]	
Etoh 2013	22.8	8.9	18	20	8.2	18	2.5%	0.32 [-0.34, 0.98]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	2.8%	0.70 [0.08, 1.33]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	2.7%	0.21 [-0.42, 0.84]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.5%	1.87 [0.42, 3.32]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.4%	2.05 [0.36, 3.75]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.3%	0.12 [-0.78, 1.02]	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	0.9%	0.19 [-0.90, 1.29]	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.4%	0.62 [-0.26, 1.50]	
Talelli 2012	74.5	18	13	63.4	26.4	12	1.7%	0.48 [-0.32, 1.28]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	1.7%	-0.18 [-0.99, 0.62]	
Theilig 2011	21	30.5	12	20	18.5	12	1.7%	0.04 [-0.76, 0.84]	
Wang CP 2014	29.6	22.5	17	32.3	24	16	2.3%	-0.11 [-0.80, 0.57]	
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.2%	-0.08 [-0.78, 0.63]	
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.0%	0.97 [-0.05, 1.99]	
Subtotal (95% CI)			281			293	38.1%	0.39 [0.21, 0.58]	
Heterogeneity: Tau² = 0.02; Chi² = 25.10, df = 22 (P = 0.29); I² = 12%									
Test for overall effect: Z = 4.24 (P < 0.0001)									
2.4.4 ≥15 sessions									
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	7.3%	0.52 [0.13, 0.90]	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.3%	0.21 [-0.70, 1.11]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	2.7%	-0.14 [-0.77, 0.50]	
Lüdemann-Podubecká 2015	49.9	14.6	9	51.1	15.9	8	1.2%	-0.07 [-1.03, 0.88]	
Lüdemann-Podubecká 2015	51.4	14.7	11	48.8	17.1	12	1.6%	0.16 [-0.66, 0.98]	
Sung 2013	30.4	11.8	12	28.7	13.1	14	1.8%	0.13 [-0.64, 0.90]	
Sung 2013	35.4	16.1	13	28.7	13.1	14	1.8%	0.44 [-0.32, 1.21]	
Sung 2013	30.9	10.3	15	28.7	13.1	14	2.0%	0.18 [-0.55, 0.91]	
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.3%	0.29 [-0.40, 0.98]	
Wang CP 2014	33.7	23.6	16	27.2	19.6	16	2.2%	0.29 [-0.41, 0.99]	
Subtotal (95% CI)			175			177	24.3%	0.27 [0.06, 0.48]	
Heterogeneity: Tau² = 0.00; Chi² = 4.14, df = 9 (P = 0.90); I² = 0%									
Test for overall effect: Z = 2.53 (P = 0.01)									
Total (95% CI)			750			757	100.0%	0.46 [0.36, 0.57]	
Heterogeneity: Tau² = 0.00; Chi² = 54.50, df = 57 (P = 0.57); I² = 0%									
Test for overall effect: Z = 8.72 (P < 0.00001)									
Test for subgroup differences: Chi² = 9.45, df = 3 (P = 0.02), I² = 68.3%									

-4   -2   0   2   4
Favours [experimental]   Favours [control]

Fig S6. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sessions rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV. Random, 95% CI	Std. Mean Difference IV. Random, 95% CI
2.5.1 bilateral									
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.4%	0.62 [-0.26, 1.50]	
Sung 2013	30.4	118	12	28.7	13.1	14	1.8%	0.02 [-0.75, 0.79]	
Sung 2013	35.4	16.1	13	28.7	13.1	14	1.8%	0.44 [-0.32, 1.21]	
Sung 2013	30.9	10.3	15	28.7	13.1	14	2.0%	0.18 [-0.55, 0.91]	
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.3%	0.29 [-0.40, 0.98]	
Wang CP 2014	33.7	23.6	15	27.2	19.6	16	2.1%	0.29 [-0.42, 1.00]	
Subtotal (95% CI)			**83**			**84**	**11.4%**	**0.29 [-0.01, 0.60]**	

Heterogeneity: Tau² = 0.00; Chi² = 1.24, df = 5 (P = 0.94); I² = 0%
Test for overall effect: Z = 1.88 (P = 0.06)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV. Random, 95% CI	Std. Mean Difference IV. Random, 95% CI
2.5.2 unilateral									
Ameli 2009	3.3	1.8	13	3.4	1.8	13	1.8%	-0.05 [-0.82, 0.72]	
Ameli 2009	3.8	1.2	16	3.3	1.2	16	2.2%	0.41 [-0.29, 1.11]	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.4%	0.44 [-0.44, 1.32]	
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.4%	0.37 [-0.51, 1.25]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.1%	0.28 [-0.70, 1.27]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.0%	0.88 [-0.13, 1.89]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	1.7%	1.26 [0.47, 2.06]	
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	7.2%	0.52 [0.13, 0.90]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.0%	-0.01 [-0.73, 0.72]	
Dafotakis 2008	-40	22	12	-66	28	12	1.4%	1.00 [0.14, 1.85]	
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	0.8%	0.23 [-0.91, 1.37]	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.3%	0.21 [-0.70, 1.11]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	2.7%	0.32 [-0.31, 0.94]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	2.6%	0.68 [0.04, 1.31]	
Etoh 2013	22.8	8.9	18	20	8.2	18	2.5%	0.32 [-0.34, 0.98]	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	0.9%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.0%	1.52 [0.47, 2.57]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	2.7%	0.70 [0.08, 1.33]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	2.7%	0.21 [-0.42, 0.84]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.5%	1.87 [0.42, 3.32]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	2.6%	-0.14 [-0.77, 0.50]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.1%	0.44 [-0.15, 1.02]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.0%	0.73 [0.13, 1.33]	
Khedr 2009	68.9	64	12	31	47	12	1.6%	0.65 [-0.17, 1.48]	
Khedr 2009	57.7	26	12	31	47	12	1.6%	0.68 [-0.15, 1.51]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	1.7%	0.65 [-0.14, 1.44]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.5%	0.91 [0.08, 1.75]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.4%	2.05 [0.36, 3.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12	1.5%	0.95 [0.10, 1.80]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	6	0.7%	0.42 [-0.84, 1.69]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.6%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.2%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.4%	0.05 [-0.82, 0.93]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.3%	0.12 [-0.78, 1.02]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7	0.9%	0.70 [-0.39, 1.80]	
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	1.3%	0.55 [-0.35, 1.45]	
Nowak 2008	656	147	15	546	98	15	1.9%	0.86 [0.10, 1.61]	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	0.9%	0.19 [-0.90, 1.29]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17	2.3%	0.50 [-0.18, 1.19]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.2%	0.95 [0.01, 1.89]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.0%	1.33 [0.28, 2.38]	
Sung 2013	30.1	12.5	15	28.8	10.2	12	1.8%	0.11 [-0.65, 0.87]	
Sung 2013	34.8	13.7	13	27.6	12.8	14	1.8%	0.53 [-0.24, 1.30]	
Sung 2013	34.8	13.7	13	28.8	10.2	12	1.7%	0.48 [-0.32, 1.28]	
Sung 2013	30.1	12.5	15	27.6	12.8	14	2.0%	0.19 [-0.54, 0.92]	
Takeuchi 2005	142	27	10	120	15.5	10	1.2%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.2%	0.99 [0.05, 1.93]	
Talelli 2007	-204	39.2	6	-268	76	6	0.7%	0.98 [-0.25, 2.20]	
Talelli 2007	-259	61.2	6	-268	76	6	0.8%	0.12 [-1.01, 1.25]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	1.7%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	1.7%	0.48 [-0.32, 1.28]	
Theilig 2011	21	30.5	12	20	18.5	12	1.7%	0.04 [-0.76, 0.84]	
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.0%	0.97 [-0.05, 1.99]	
Subtotal (95% CI)			**680**			**683**	**88.6%**	**0.50 [0.39, 0.61]**	

Heterogeneity: Tau² = 0.00; Chi² = 46.34, df = 52 (P = 0.70); I² = 0%
Test for overall effect: Z = 8.92 (P < 0.00001)

Total (95% CI)			**763**			**767**	**100.0%**	**0.48 [0.37, 0.58]**	

Heterogeneity: Tau² = 0.00; Chi² = 49.11, df = 58 (P = 0.79); I² = 0%
Test for overall effect: Z = 9.03 (P < 0.00001)
Test for subgroup differences: Chi² = 1.53, df = 1 (P = 0.22), I² = 34.8%

Fig S7. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sites rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals. Relative weight for each trial is indicated by the size of the corresponding square.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV. Random, 95% CI
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.7%	0.44 [-0.44, 1.32]
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.7%	0.37 [-0.51, 1.25]
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.4%	0.28 [-0.70, 1.27]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.3%	0.88 [-0.13, 1.89]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.1%	1.26 [0.47, 2.06]
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	9.0%	0.52 [0.13, 0.90]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.5%	-0.01 [-0.73, 0.72]
Dafotakis 2008	-40	22	12	-66	40	12		Not estimable
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.0%	0.23 [-0.91, 1.37]
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.6%	0.21 [-0.70, 1.11]
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.4%	0.32 [-0.31, 0.94]
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.2%	0.68 [0.04, 1.31]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.1%	0.29 [-0.79, 1.37]
Gillick 2014	5.8	2.8	10	1.9	2	9	1.2%	1.52 [0.47, 2.57]
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.4%	0.70 [0.08, 1.33]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.3%	0.21 [-0.42, 0.84]
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.6%	1.87 [0.42, 3.32]
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.3%	-0.14 [-0.77, 0.50]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.9%	0.44 [-0.15, 1.02]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.7%	0.73 [0.13, 1.33]
Khedr 2009	68.9	64	12	31	47	12	1.9%	0.65 [-0.17, 1.48]
Khedr 2009	57.7	26	12	31	47	12	1.9%	0.68 [-0.15, 1.51]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.1%	0.65 [-0.14, 1.44]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.9%	0.91 [0.08, 1.75]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.8%	0.42 [-0.84, 1.69]
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.5%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.9%	0.32 [-0.50, 1.15]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.7%	0.05 [-0.82, 0.93]
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.6%	0.12 [-0.78, 1.02]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	1.6%	0.55 [-0.35, 1.45]
Nowak 2008	656	147	15	546	98	15		Not estimable
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.1%	0.19 [-0.90, 1.29]
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.5%	0.95 [0.01, 1.89]
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.2%	1.33 [0.28, 2.38]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.7%	0.62 [-0.26, 1.50]
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.1%	0.85 [0.06, 1.64]
Sung 2013	66.5	19.7	15	54.6	19.5	14	2.4%	0.59 [-0.16, 1.34]
Sung 2013	60.3	16.6	15	56.2	22	12	2.3%	0.21 [-0.55, 0.97]
Sung 2013	67.2	24.8	12	54.6	19.5	14	2.1%	0.55 [-0.24, 1.34]
Takeuchi 2005	142	27	10	120	15.5	10	1.5%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	2	10	1.4%	1.17 [0.21, 2.14]
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable
Talelli 2012	74.5	18	13	63.4	26.4	12	2.1%	0.48 [-0.32, 1.28]
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.1%	-0.18 [-0.99, 0.62]
Theilig 2011	21	30.5	12	20	18.5	12	2.1%	0.04 [-0.76, 0.84]
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.8%	0.29 [-0.40, 0.98]
Wang CP 2014	33.7	23.6	15	27.2	19.6	16	2.6%	0.29 [-0.42, 1.00]
Wang CP 2014	29.6	22.5	17	32.3	24	16	2.8%	-0.11 [-0.80, 0.57]
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.3%	0.97 [-0.05, 1.99]
Total (95% CI)			617			621	100.0%	0.49 [0.37, 0.60]

Heterogeneity: Tau² = 0.00; Chi² = 43.94, df = 46 (P = 0.56); I² = 0%
Test for overall effect: Z = 8.30 (P < 0.00001)

Favours [control]   Favours [experimental]

Fig S8. Forest plot from the meta-analysis of rTMS on limb motor function showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.2.1 Low frequency								
J,DU 2016	1.89	1.11	23	2.68	0.89	23	11.9%	-0.77 [-1.37, -0.17]
Khedr 2009	2.8	1.2	12	3.6	1.3	12	7.8%	-0.62 [-1.44, 0.21]
Lüdemann-Podubecká 2015	1.01	0.37	11	0.84	0.64	12	7.8%	0.31 [-0.51, 1.13]
Lüdemann-Podubecká 2015	0.85	0.39	9	1.45	1.25	8	6.0%	-0.63 [-1.62, 0.35]
Lüdemann-Podubecká 2016	0.74	0.5	10	0.63	0.43	10	7.1%	0.23 [-0.65, 1.11]
Matsuura 2015	9.19	3.57	10	7.01	2.56	10	6.8%	0.67 [-0.23, 1.58]
Sung 2013	2.2	1.4	13	3.3	1.3	12	7.9%	-0.79 [-1.61, 0.03]
Sung 2013	2.5	1.3	15	3.3	1.3	12	8.5%	-0.60 [-1.38, 0.18]
Sung 2013	2.2	1.4	13	2.9	1.2	14	8.6%	-0.52 [-1.29, 0.25]
Sung 2013	2.5	1.3	15	2.9	1.2	14	9.2%	-0.31 [-1.04, 0.42]
Theilig 2011	0.98	0.56	12	1.04	0.44	12	8.2%	-0.12 [-0.92, 0.69]
Wang CP 2014	4.4	3.4	17	3.9	2.6	16	10.1%	0.16 [-0.52, 0.84]
Subtotal (95% CI)			160			155	100.0%	-0.27 [-0.54, -0.00]
1.2.2 High frequency								
Ackerley 2014	0.68	0.08	12	0.58	0.1	12		Not estimable
Ackerley 2014	0.66	0.11	12	0.58	0.1	12		Not estimable
Hsu 2013	0.06	0.13	5	0.06	0.07	4	7.9%	0.00 [-1.31, 1.31]
J,DU 2016	1.81	1.09	23	1.34	0.73	23	26.1%	0.50 [-0.09, 1.09]
Khedr 2009	2.8	1.5	9	2.3	1.2	8	13.3%	0.35 [-0.61, 1.31]
Khedr 2010	1.1	1.1	11	1.1	1.1	5	11.5%	0.00 [-1.06, 1.06]
Lomarve 2007	338	63	5	153	26	5	2.8%	3.47 [1.15, 5.78]
Sung 2013	2	1.8	12	1.4	1	14	18.2%	0.41 [-0.37, 1.19]
Wang CP 2014	2.3	2.7	15	0.9	1.8	16	20.2%	0.60 [-0.12, 1.32]
Subtotal (95% CI)			80			75	100.0%	0.47 [0.07, 0.87]

Heterogeneity: Tau² = 0.06; Chi² = 15.43, df = 11 (P = 0.16); I² = 29%
Test for overall effect: Z = 1.98 (P = 0.05)

Heterogeneity: Tau² = 0.07; Chi² = 7.92, df = 6 (P = 0.24); I² = 24%
Test for overall effect: Z = 2.31 (P = 0.02)

Test for subgroup differences: Chi² = 9.14, df = 1 (P = 0.003), I² = 89.1%

Fig S9. Forest plot from the meta-analysis of rTMS on motor evoked potentials showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over study.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
2.1.1 AMT									
Di Lazzaro 2013	0.07	0.05	6	0.05	0.05	6	1.1%	0.37 [-0.78, 1.52]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.6%	0.32 [-0.31, 0.94]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.4%	0.68 [0.04, 1.31]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.7%	1.87 [0.42, 3.32]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.5%	-0.14 [-0.77, 0.50]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.7%	0.12 [-0.78, 1.02]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	2.3%	0.55 [-0.24, 1.34]	
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable	
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.2%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	2.2%	0.48 [-0.32, 1.28]	
Wang CP 2014	30.4	23.6	15	27.2	19.6	16	2.8%	0.14 [-0.56, 0.85]	
Subtotal (95% CI)			131			136	23.5%	0.31 [0.05, 0.57]	
Heterogeneity: Tau² = 0.02; Chi² = 9.95, df = 9 (P = 0.35); I² = 10%									
Test for overall effect: Z = 2.33 (P = 0.02)									
2.1.2 RMT									
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable	
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable	
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.8%	0.37 [-0.51, 1.25]	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.8%	0.44 [-0.44, 1.32]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.4%	0.28 [-0.70, 1.27]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.4%	0.88 [-0.13, 1.89]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.2%	1.26 [0.47, 2.06]	
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	9.6%	0.52 [0.13, 0.90]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.7%	-0.01 [-0.73, 0.72]	
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.7%	0.21 [-0.70, 1.11]	
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.2%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.3%	1.52 [0.47, 2.57]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.6%	0.70 [0.08, 1.33]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.5%	0.21 [-0.42, 0.84]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	4.1%	0.44 [-0.15, 1.02]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.9%	0.73 [0.13, 1.33]	
Khedr 2009	68.9	64	12	31	47	12	2.1%	0.65 [-0.17, 1.48]	
Khedr 2009	57.7	26	12	31	47	12	2.1%	0.68 [-0.15, 1.51]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	2.0%	0.91 [0.08, 1.75]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.2%	0.65 [-0.14, 1.44]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.9%	0.42 [-0.84, 1.69]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.6%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	2.1%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.8%	0.05 [-0.82, 0.93]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable	
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.8%	0.38 [-0.51, 1.26]	
Nowak 2008	656	147	15	546	98	15		Not estimable	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.2%	0.19 [-0.90, 1.29]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.6%	0.95 [0.01, 1.89]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.3%	1.33 [0.28, 2.38]	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.8%	0.62 [-0.26, 1.50]	
Sung 2013	70	24.5	15	56.3	12.3	14	2.5%	0.68 [-0.07, 1.43]	
Sung 2013	60.3	16.6	12	56.3	12.3	14	2.3%	0.27 [-0.51, 1.04]	
Takeuchi 2005	142	27	10	120	15.5	10	1.6%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.6%	0.99 [0.05, 1.93]	
Theilig 2011	21	30.5	12	20	18.5	12	2.2%	0.04 [-0.76, 0.84]	
Wang CP 2014	29.6	22.5	17	32.3	24	16	3.0%	-0.11 [-0.80, 0.57]	
Subtotal (95% CI)			445			448	76.5%	0.53 [0.39, 0.66]	
Heterogeneity: Tau² = 0.00; Chi² = 29.20, df = 33 (P = 0.66); I² = 0%									
Test for overall effect: Z = 7.59 (P < 0.00001)									
Total (95% CI)			576			584	100.0%	0.47 [0.36, 0.59]	
Heterogeneity: Tau² = 0.00; Chi² = 41.53, df = 43 (P = 0.53); I² = 0%									
Test for overall effect: Z = 7.83 (P < 0.00001)									
Test for subgroup differences: Chi² = 2.10, df = 1 (P = 0.15), I² = 52.4%									

Favours [control]   Favours [experimental]

Fig S10. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing active motor threshold and resting motor threshold rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

	Experimental			Control				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
2.6.1 <90 AMT(%)									
Di Lazzaro 2013	0.07	0.05	6	0.05	0.05	6	5.2%	0.37 [-0.78, 1.52]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	14.4%	0.32 [-0.31, 0.94]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	3.3%	1.87 [0.42, 3.32]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	9.9%	0.55 [-0.24, 1.34]	
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable	
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable	
Wang CP 2014	30.4	23.6	15	32.3	24	16	11.9%	-0.08 [-0.78, 0.63]	
Subtotal (95% CI)			59			62	44.8%	0.41 [-0.05, 0.88]	

Heterogeneity: Tau² = 0.09; Chi² = 5.87, df = 4 (P = 0.21); I² = 32%
Test for overall effect: Z = 1.74 (P = 0.08)

2.6.2 [90-100) AMT(%)									
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	7.9%	0.12 [-0.78, 1.02]	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	9.7%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	9.7%	0.48 [-0.32, 1.28]	
Subtotal (95% CI)			34			34	27.3%	0.14 [-0.34, 0.62]	

Heterogeneity: Tau² = 0.00; Chi² = 1.32, df = 2 (P = 0.52); I² = 0%
Test for overall effect: Z = 0.58 (P = 0.56)

2.6.3 ≥100 AMT(%)									
Emara 2010	56.8	19.2	20	45.1	14.4	20	13.9%	0.68 [0.04, 1.31]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	14.0%	-0.14 [-0.77, 0.50]	
Subtotal (95% CI)			38			40	27.9%	0.27 [-0.53, 1.07]	

Heterogeneity: Tau² = 0.22; Chi² = 3.11, df = 1 (P = 0.08); I² = 68%
Test for overall effect: Z = 0.66 (P = 0.51)

| Total (95% CI) | | | 131 | | | 136 | 100.0% | 0.29 [0.01, 0.56] | |

Heterogeneity: Tau² = 0.03; Chi² = 10.84, df = 9 (P = 0.29); I² = 17%
Test for overall effect: Z = 2.06 (P = 0.04)
Test for subgroup differences: Chi² = 0.63, df = 2 (P = 0.73), I² = 0%

-10   -5   0   5   10
Favours [experimental]   Favours [control]

Fig S11. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different active motor threshold (AMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.7.1 <90 RMT(%)								
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
J,DU 2016	30.52	17.11	23	23.92	11.96	23	5.4%	0.44 [-0.15, 1.02]
Subtotal (95% CI)			23			23	5.4%	0.44 [-0.15, 1.02]
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.47 (P = 0.14)								
2.7.2 [90-100) RMT(%)								
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	2.4%	0.44 [-0.44, 1.32]
Avenanti 2012	134.64	55	8	104.34	89.25	14	2.4%	0.37 [-0.51, 1.25]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.8%	0.88 [-0.13, 1.89]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.9%	1.26 [0.47, 2.06]
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	12.5%	0.52 [0.13, 0.90]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	3.5%	-0.01 [-0.73, 0.72]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Gillick 2014	5.8	2.8	10	1.9	2	9	1.7%	1.52 [0.47, 2.57]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	4.6%	0.21 [-0.42, 0.84]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Sasaki 2013	4.2	2.8	9	0.6	0.7	9	1.5%	1.68 [0.57, 2.79]
Sasaki 2013	2.3	2.9	11	0.6	0.7	9	2.2%	0.74 [-0.18, 1.65]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	2.4%	0.62 [-0.26, 1.50]
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.9%	0.85 [0.06, 1.64]
Sung 2013	60.3	16.6	15	56.3	12.3	14	3.4%	0.26 [-0.47, 1.00]
Takeuchi 2005	142	27	10	120	15.5	10	2.1%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	2.1%	0.99 [0.05, 1.93]
Wang CP 2014	29.6	22.5	17	32.3	24	16	3.9%	-0.11 [-0.80, 0.57]
Subtotal (95% CI)			235			239	52.4%	0.60 [0.37, 0.83]
Heterogeneity: Tau² = 0.06; Chi² = 20.77, df = 15 (P = 0.14); I² = 28%								
Test for overall effect: Z = 5.09 (P < 0.00001)								
2.7.3 [100-110) RMT(%)								
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	2.3%	0.21 [-0.70, 1.11]
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.6%	0.29 [-0.79, 1.37]
Khedr 2009	57.7	26	12	31	47	12	2.7%	0.68 [-0.15, 1.51]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.9%	0.65 [-0.14, 1.44]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.6%	2.05 [0.36, 3.75]
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	2.0%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	2.7%	0.32 [-0.50, 1.15]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	2.3%	0.55 [-0.35, 1.45]
Nowak 2008	656	147	15	546	98	15		Not estimable
Theilig 2011	21	30.5	12	20	18.5	12	2.9%	0.04 [-0.76, 0.84]
Subtotal (95% CI)			91			87	20.0%	0.42 [0.12, 0.72]
Heterogeneity: Tau² = 0.00; Chi² = 6.01, df = 8 (P = 0.65); I² = 0%								
Test for overall effect: Z = 2.72 (P = 0.007)								
2.7.4 ≥110 RMT(%)								
Blesneag AV 2015	42.86	14.84	8	38.32	15.15	8	1.9%	0.29 [-0.70, 1.27]
Guan 2017	8.6	2.9	21	6.7	2.4	21	4.7%	0.70 [0.08, 1.33]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	5.1%	0.73 [0.13, 1.33]
Khedr 2009	68.9	64	12	31	47	12	2.7%	0.65 [-0.17, 1.48]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	2.7%	0.91 [0.08, 1.75]
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	1.2%	0.42 [-0.84, 1.69]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	2.4%	0.05 [-0.82, 0.93]
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.5%	0.19 [-0.90, 1.29]
Subtotal (95% CI)			97			99	22.2%	0.57 [0.28, 0.86]
Heterogeneity: Tau² = 0.00; Chi² = 3.28, df = 7 (P = 0.86); I² = 0%								
Test for overall effect: Z = 3.90 (P < 0.0001)								
Total (95% CI)			446			448	100.0%	0.53 [0.40, 0.67]
Heterogeneity: Tau² = 0.00; Chi² = 30.89, df = 33 (P = 0.57); I² = 0%								
Test for overall effect: Z = 7.69 (P < 0.00001)								
Test for subgroup differences: Chi² = 1.02, df = 3 (P = 0.80), I² = 0%								

Favours [control]   Favours [experimental]

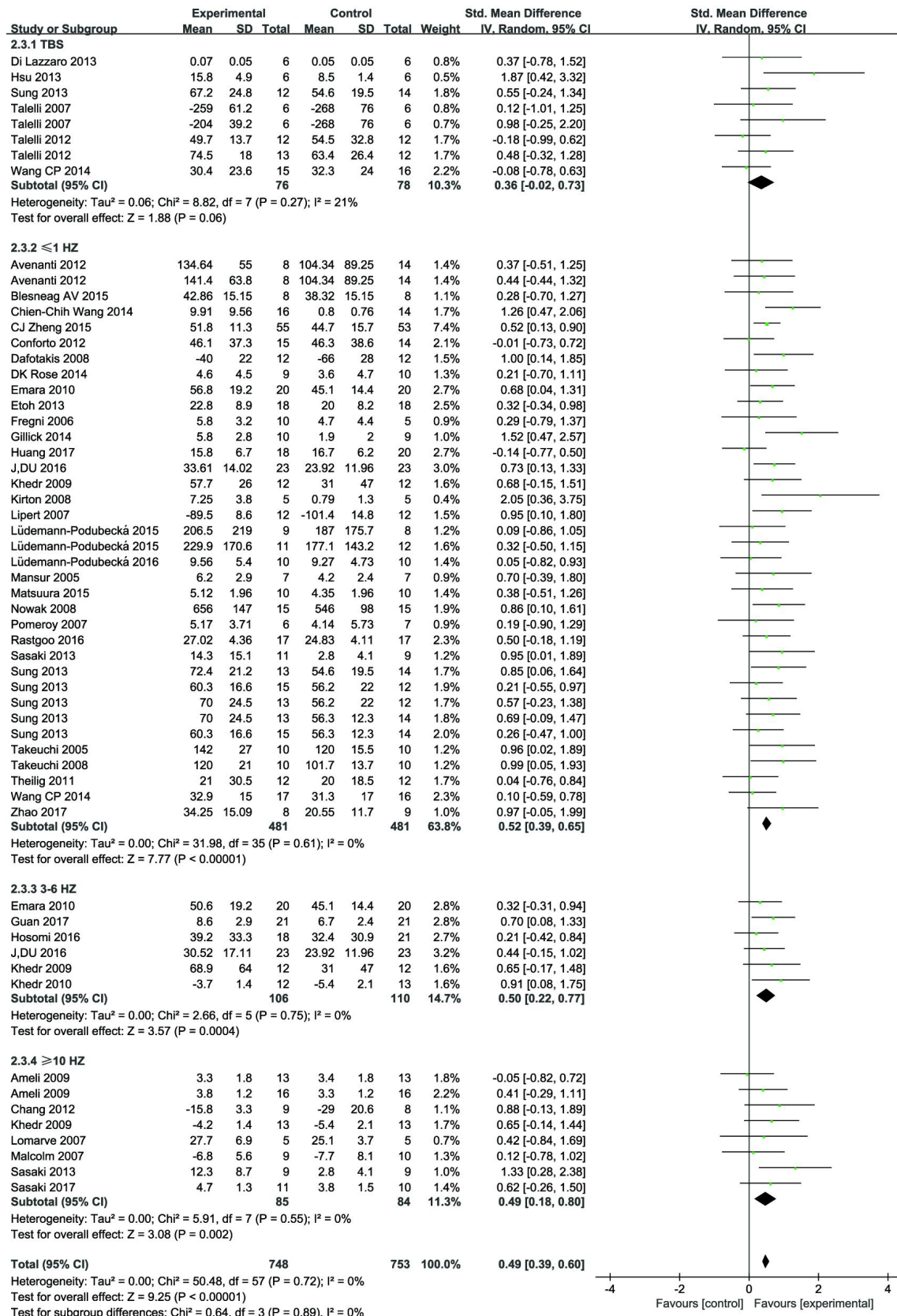**Fig S12.** Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different resting motor threshold (RMT)rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.2.1 ≤600 pulses								
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.1%	1.26 [0.47, 2.06]
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.0%	0.23 [-0.91, 1.37]
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.2%	0.68 [0.04, 1.31]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Gillick 2014	5.8	2.8	10	1.9	2	9	1.2%	1.52 [0.47, 2.57]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.3%	0.21 [-0.42, 0.84]
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.8%	0.42 [-0.84, 1.69]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Nowak 2008	656	147	15	546	98	15		Not estimable
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.1%	0.19 [-0.90, 1.29]
Sung 2013	66.5	19.7	15	54.6	19.5	14	2.4%	0.59 [-0.16, 1.34]
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.1%	0.85 [0.06, 1.64]
Sung 2013	60.3	16.6	15	56.2	22	12	2.3%	0.21 [-0.55, 0.97]
Sung 2013	67.2	24.8	12	54.6	19.5	14	2.1%	0.55 [-0.24, 1.34]
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable
Talelli 2012	74.5	18	13	63.4	26.4	12	2.1%	0.48 [-0.32, 1.28]
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.1%	-0.18 [-0.99, 0.62]
Wang CP 2014	33.7	23.6	15	27.2	19.6	16	2.6%	0.29 [-0.42, 1.00]
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.8%	0.29 [-0.40, 0.98]
Wang CP 2014	29.6	22.5	17	32.3	24	16	2.8%	-0.11 [-0.80, 0.57]
Subtotal (95% CI)			210			208	34.0%	0.44 [0.23, 0.64]

Heterogeneity: Tau² = 0.01; Chi² = 16.33, df = 15 (P = 0.36); I² = 8%
Test for overall effect: Z = 4.16 (P < 0.0001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.2.2 600-1200 pulses								
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.4%	0.28 [-0.70, 1.27]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.3%	0.88 [-0.13, 1.89]
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.4%	0.32 [-0.31, 0.94]
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.1%	0.29 [-0.79, 1.37]
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.4%	0.70 [0.08, 1.33]
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.6%	1.87 [0.42, 3.32]
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.2%	-0.14 [-0.77, 0.50]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.9%	0.44 [-0.15, 1.02]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.7%	0.73 [0.13, 1.33]
Khedr 2009	68.9	64	12	31	47	12	1.9%	0.65 [-0.17, 1.48]
Khedr 2009	57.7	26	12	31	47	12	1.9%	0.68 [-0.15, 1.51]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.9%	0.91 [0.08, 1.75]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.1%	0.65 [-0.14, 1.44]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.5%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.9%	0.32 [-0.50, 1.15]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.7%	0.05 [-0.82, 0.93]
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.7%	0.38 [-0.51, 1.26]
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.2%	1.33 [0.28, 2.38]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.7%	0.62 [-0.26, 1.50]
Theilig 2011	21	30.5	12	20	18.5	12	2.1%	0.04 [-0.76, 0.84]
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.3%	0.97 [-0.05, 1.99]
Subtotal (95% CI)			272			269	43.3%	0.52 [0.34, 0.69]

Heterogeneity: Tau² = 0.00; Chi² = 20.56, df = 21 (P = 0.49); I² = 0%
Test for overall effect: Z = 5.82 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.2.3 1200-1600 pulses								
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.7%	0.37 [-0.51, 1.25]
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.7%	0.44 [-0.44, 1.32]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.5%	-0.01 [-0.73, 0.72]
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.6%	0.21 [-0.70, 1.11]
Takeuchi 2005	142	27	10	120	15.5	10	1.5%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.5%	0.99 [0.05, 1.93]
Subtotal (95% CI)			60			72	10.5%	0.44 [0.08, 0.79]

Heterogeneity: Tau² = 0.00; Chi² = 4.19, df = 5 (P = 0.52); I² = 0%
Test for overall effect: Z = 2.43 (P = 0.02)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.2.4 >1600 pulses								
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	9.0%	0.52 [0.13, 0.90]
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.6%	0.12 [-0.78, 1.02]
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.5%	0.95 [0.01, 1.89]
Subtotal (95% CI)			75			72	12.1%	0.52 [0.19, 0.85]

Heterogeneity: Tau² = 0.00; Chi² = 1.55, df = 2 (P = 0.46); I² = 0%
Test for overall effect: Z = 3.07 (P = 0.002)

| **Total (95% CI)** | | | 617 | | | 621 | 100.0% | 0.48 [0.37, 0.60] |

Heterogeneity: Tau² = 0.00; Chi² = 43.12, df = 46 (P = 0.59); I² = 0%
Test for overall effect: Z = 8.22 (P < 0.00001)
Test for subgroup differences: Chi² = 0.44, df = 3 (P = 0.93), I² = 0%

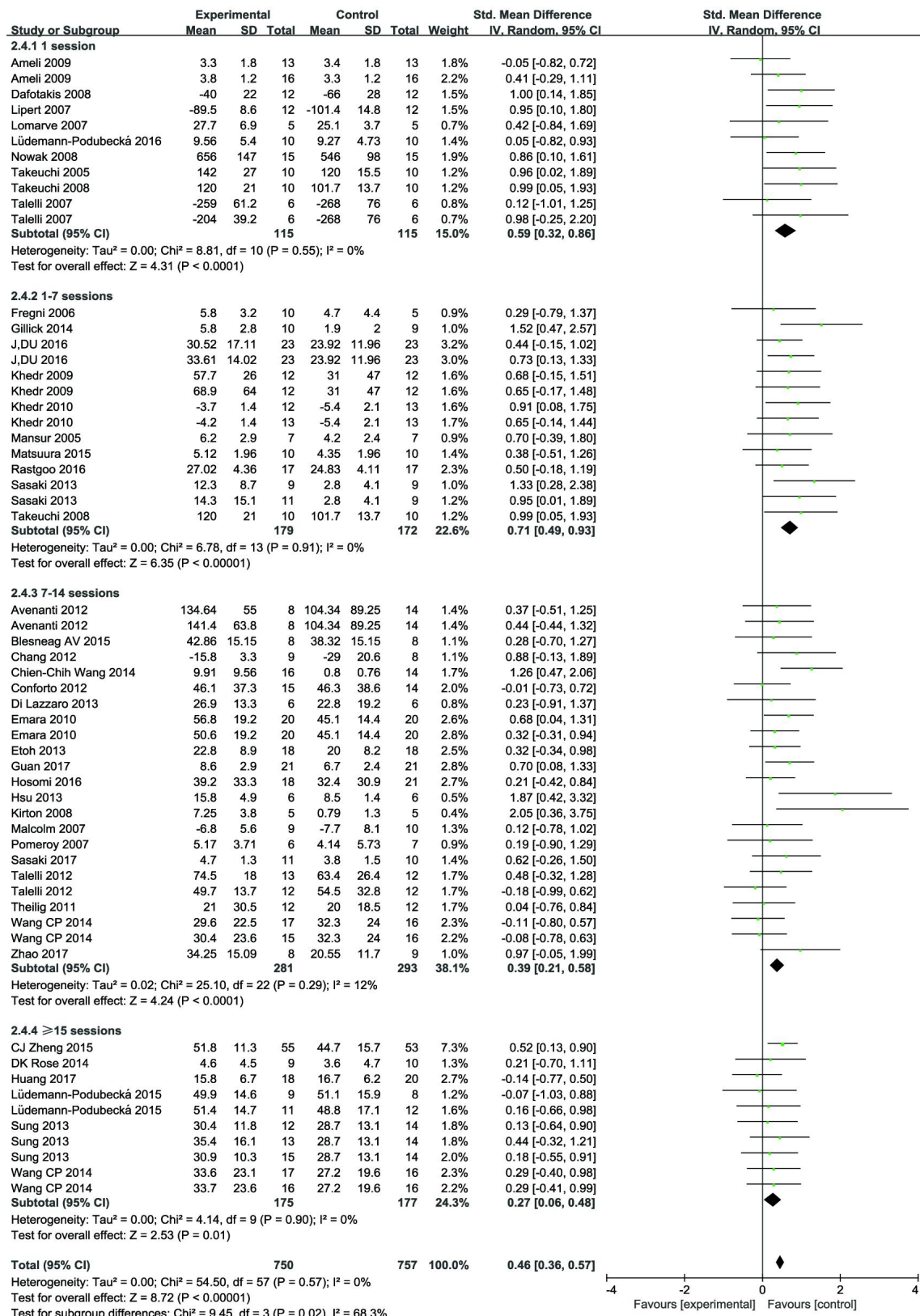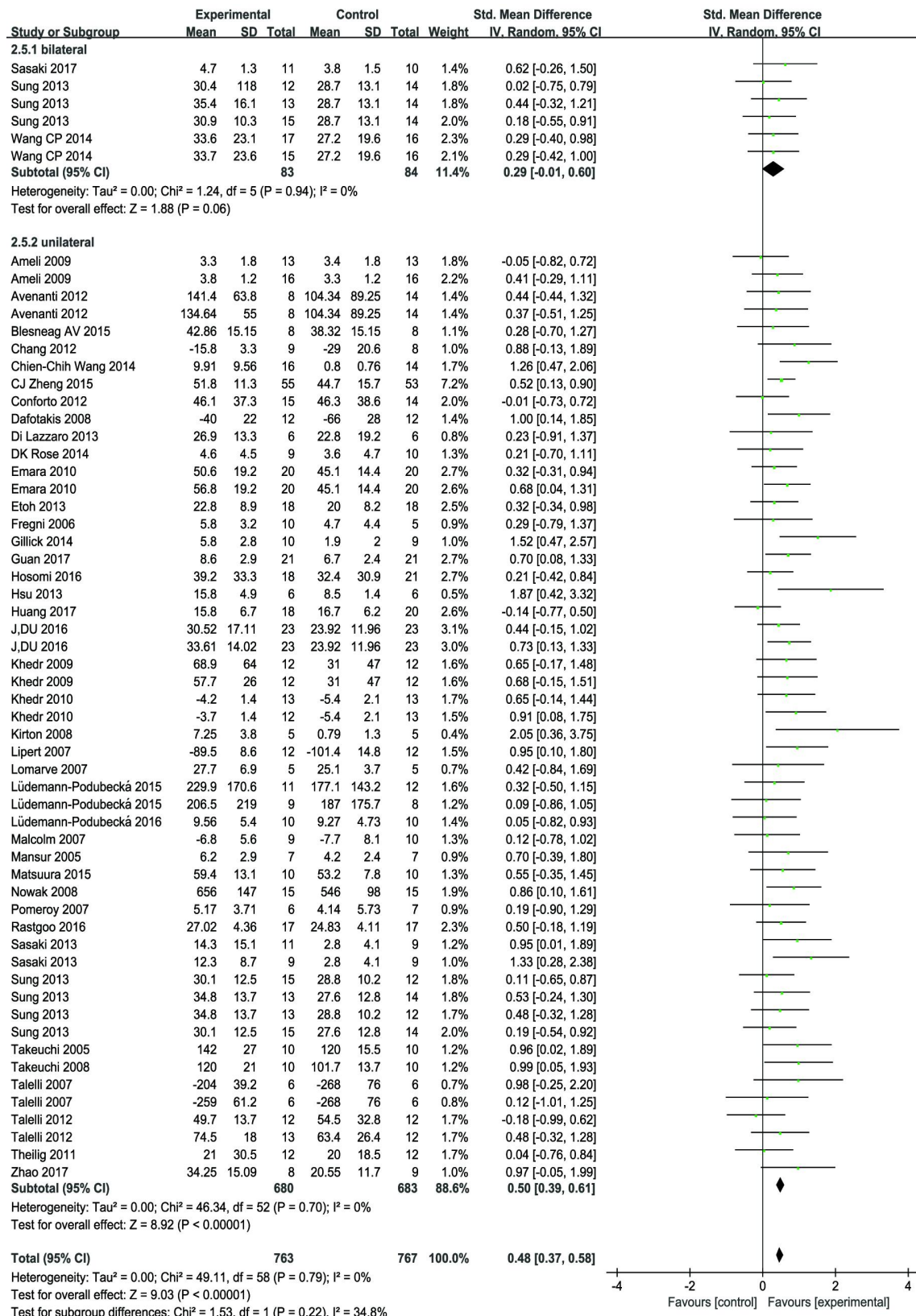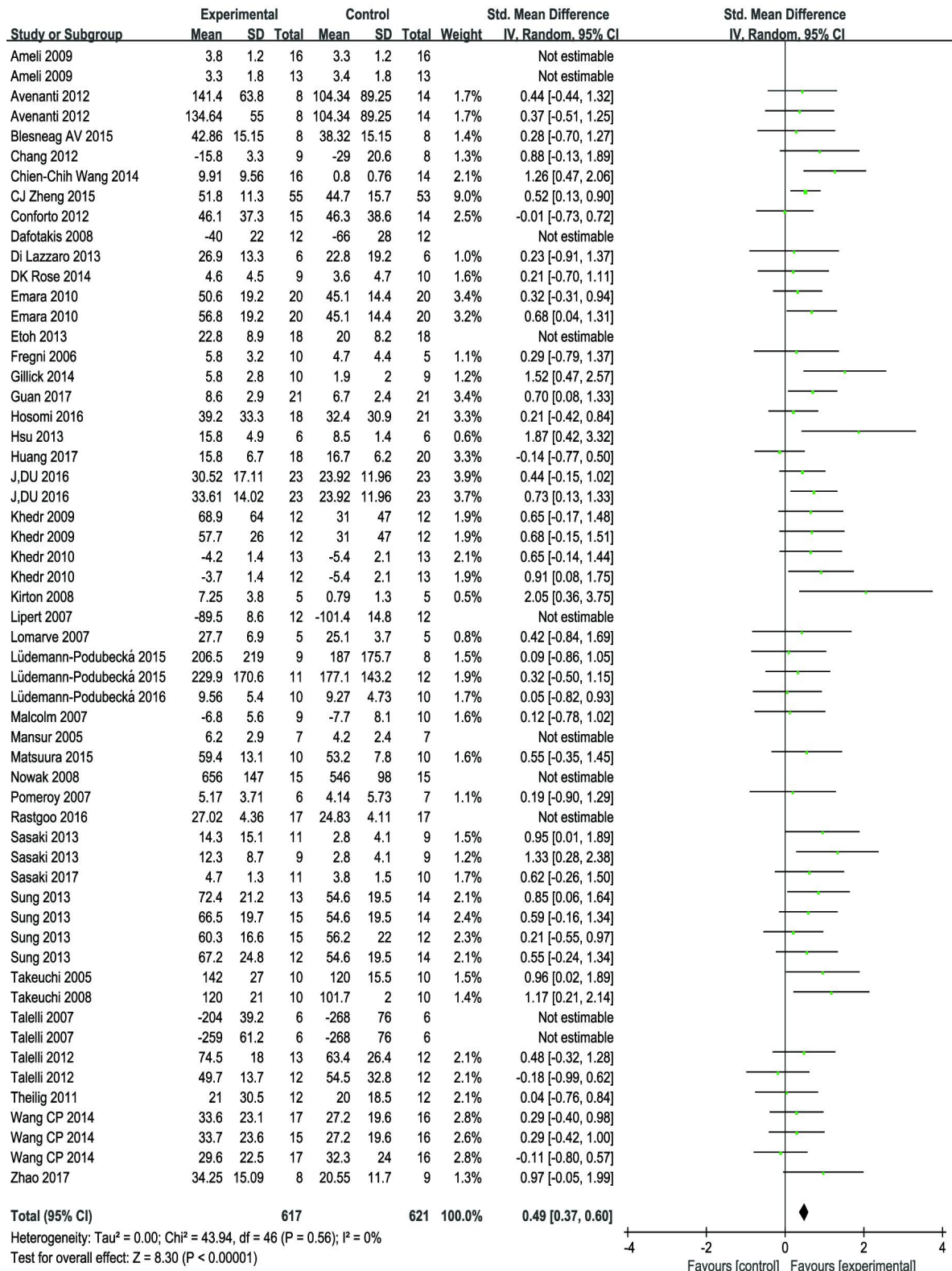Favours [control]   Favours [experimental]

Fig S13. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation pulses rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.3.1 TBS								
Di Lazzaro 2013	0.07	0.05	6	0.05	0.05	6	1.0%	0.37 [-0.78, 1.52]
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.6%	1.87 [0.42, 3.32]
Sung 2013	67.2	24.8	12	54.6	19.5	14	2.1%	0.55 [-0.24, 1.34]
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable
Talelli 2012	74.5	18	13	63.4	26.4	12	2.0%	0.48 [-0.32, 1.28]
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.0%	-0.18 [-0.99, 0.62]
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.6%	-0.08 [-0.78, 0.63]
Subtotal (95% CI)			64			66	10.4%	0.34 [-0.11, 0.79]

Heterogeneity: Tau² = 0.10; Chi² = 7.58, df = 5 (P = 0.18); I² = 34%
Test for overall effect: Z = 1.49 (P = 0.14)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.3.2 ≤1 HZ								
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.7%	0.37 [-0.51, 1.25]
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.7%	0.44 [-0.44, 1.32]
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.3%	0.28 [-0.70, 1.27]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.1%	1.26 [0.47, 2.06]
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	8.8%	0.52 [0.13, 0.90]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.5%	-0.01 [-0.73, 0.72]
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.6%	0.21 [-0.70, 1.11]
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.2%	0.68 [0.04, 1.31]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.1%	0.29 [-0.79, 1.37]
Gillick 2014	5.8	2.8	10	1.9	2	9	1.2%	1.52 [0.47, 2.57]
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.2%	-0.14 [-0.77, 0.50]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.6%	0.73 [0.13, 1.33]
Khedr 2009	57.7	26	12	31	47	12	1.9%	0.68 [-0.15, 1.51]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.4%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.9%	0.32 [-0.50, 1.15]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.7%	0.05 [-0.82, 0.93]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.7%	0.38 [-0.51, 1.26]
Nowak 2008	656	147	15	546	98	15		Not estimable
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.1%	0.19 [-0.90, 1.29]
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.5%	0.95 [0.01, 1.89]
Sung 2013	70	24.5	13	56.3	12.3	14	2.1%	0.69 [-0.09, 1.47]
Sung 2013	60.3	16.6	15	56.2	22	12	2.2%	0.21 [-0.55, 0.97]
Sung 2013	70	24.5	13	56.2	22	12	2.0%	0.57 [-0.23, 1.38]
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.1%	0.85 [0.06, 1.64]
Sung 2013	60.3	16.6	15	56.3	12.3	14	2.4%	0.26 [-0.47, 1.00]
Takeuchi 2005	142	27	10	120	15.5	10	1.5%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.5%	0.99 [0.05, 1.93]
Theilig 2011	21	30.5	12	20	18.5	12	2.0%	0.04 [-0.76, 0.84]
Wang CP 2014	32.9	15	17	31.3	17	16	2.8%	0.10 [-0.59, 0.78]
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.2%	0.97 [-0.05, 1.99]
Subtotal (95% CI)			400			400	63.5%	0.49 [0.34, 0.63]

Heterogeneity: Tau² = 0.00; Chi² = 28.38, df = 29 (P = 0.50); I² = 0%
Test for overall effect: Z = 6.67 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.3.3 3-6 HZ								
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.3%	0.32 [-0.31, 0.94]
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.3%	0.70 [0.08, 1.33]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.3%	0.21 [-0.42, 0.84]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.8%	0.44 [-0.15, 1.02]
Khedr 2009	68.9	64	12	31	47	12	1.9%	0.65 [-0.17, 1.48]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.9%	0.91 [0.08, 1.75]
Subtotal (95% CI)			106			110	17.5%	0.50 [0.22, 0.77]

Heterogeneity: Tau² = 0.00; Chi² = 2.66, df = 5 (P = 0.75); I² = 0%
Test for overall effect: Z = 3.57 (P = 0.0004)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.3.4 ≥10 HZ								
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.3%	0.88 [-0.13, 1.89]
Khedr 2009	-4.2	1.4	13	-5.4	2.1	13	2.1%	0.65 [-0.14, 1.44]
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.8%	0.42 [-0.84, 1.69]
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.6%	0.12 [-0.78, 1.02]
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.2%	1.33 [0.28, 2.38]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.7%	0.62 [-0.26, 1.50]
Subtotal (95% CI)			56			55	8.6%	0.65 [0.26, 1.04]

Heterogeneity: Tau² = 0.00; Chi² = 3.26, df = 5 (P = 0.66); I² = 0%
Test for overall effect: Z = 3.29 (P = 0.0010)

Total (95% CI)			626			631	100.0%	0.48 [0.37, 0.60]

Heterogeneity: Tau² = 0.00; Chi² = 43.70, df = 47 (P = 0.61); I² = 0%
Test for overall effect: Z = 8.30 (P < 0.00001)
Test for subgroup differences: Chi² = 1.10, df = 3 (P = 0.78), I² = 0%
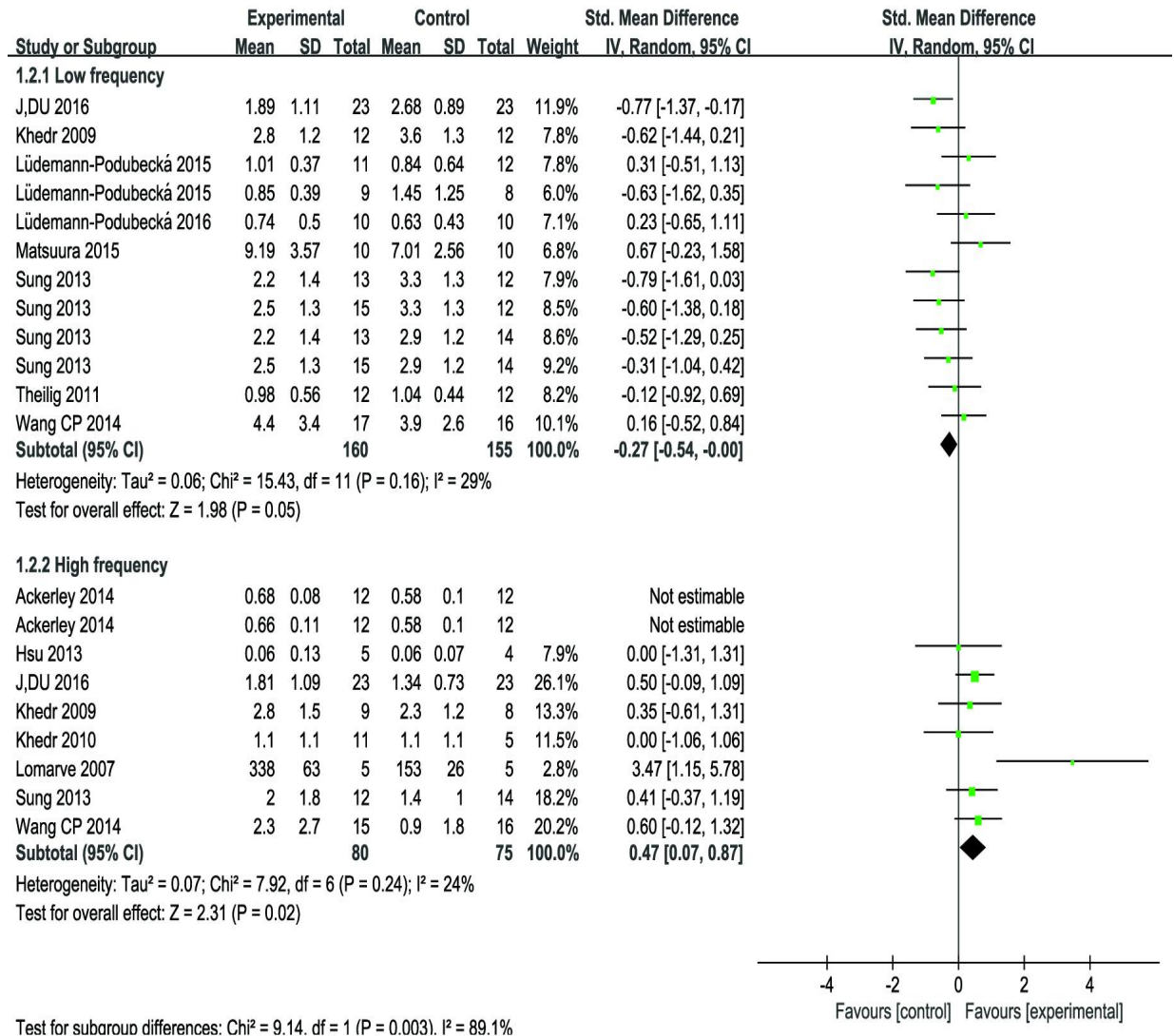
Favours [control]   Favours [experimental]

Fig S14. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation frequency rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.4.1 1 session								
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.8%	0.42 [-0.84, 1.69]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.7%	0.05 [-0.82, 0.93]
Nowak 2008	656	147	15	546	98	15		Not estimable
Takeuchi 2005	142	27	10	120	15.5	10	1.5%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.5%	0.99 [0.05, 1.93]
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable
Subtotal (95% CI)			35			35	5.5%	0.61 [0.12, 1.09]
Heterogeneity: Tau² = 0.00; Chi² = 2.77, df = 3 (P = 0.43); I² = 0%								
Test for overall effect: Z = 2.43 (P = 0.01)								
2.4.2 1-7 sessions								
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.1%	0.29 [-0.79, 1.37]
Gillick 2014	5.8	2.8	10	1.9	2	9	1.2%	1.52 [0.47, 2.57]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.6%	0.73 [0.13, 1.33]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.7%	0.44 [-0.15, 1.02]
Khedr 2009	68.9	64	12	31	47	12	1.9%	0.65 [-0.17, 1.48]
Khedr 2009	57.7	26	12	31	47	12	1.9%	0.68 [-0.15, 1.51]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.1%	0.65 [-0.14, 1.44]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.9%	0.91 [0.08, 1.75]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.7%	0.38 [-0.51, 1.26]
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.5%	0.95 [0.01, 1.89]
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.2%	1.33 [0.28, 2.38]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.5%	0.99 [0.05, 1.93]
Subtotal (95% CI)			155			148	23.1%	0.73 [0.50, 0.97]
Heterogeneity: Tau² = 0.00; Chi² = 6.40, df = 11 (P = 0.85); I² = 0%								
Test for overall effect: Z = 6.09 (P < 0.00001)								
2.4.3 7-14 sessions								
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.7%	0.44 [-0.44, 1.32]
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.7%	0.37 [-0.51, 1.25]
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.3%	0.28 [-0.70, 1.27]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.3%	0.88 [-0.13, 1.89]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.0%	1.26 [0.47, 2.06]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.4%	-0.01 [-0.73, 0.72]
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.0%	0.23 [-0.91, 1.37]
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.3%	0.32 [-0.31, 0.94]
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.2%	0.68 [0.04, 1.31]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.3%	0.70 [0.08, 1.33]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.2%	0.21 [-0.42, 0.84]
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.6%	1.87 [0.42, 3.32]
Kirton 2008	7.25	3.8	5	0.79	1.5	5	0.5%	2.05 [0.36, 3.75]
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.6%	0.12 [-0.78, 1.02]
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.1%	0.19 [-0.90, 1.29]
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.7%	0.62 [-0.26, 1.50]
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.0%	-0.18 [-0.99, 0.62]
Talelli 2012	74.5	18	13	63.4	26.4	12	2.0%	0.48 [-0.32, 1.28]
Theilig 2011	21	30.5	12	20	18.5	12	2.0%	0.04 [-0.76, 0.84]
Wang CP 2014	29.6	22.5	17	32.3	24	16	2.8%	-0.11 [-0.80, 0.57]
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.6%	-0.08 [-0.78, 0.63]
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.2%	0.97 [-0.05, 1.99]
Subtotal (95% CI)			263			275	42.6%	0.40 [0.21, 0.59]
Heterogeneity: Tau² = 0.03; Chi² = 25.06, df = 21 (P = 0.24); I² = 16%								
Test for overall effect: Z = 4.07 (P < 0.0001)								
2.4.4 ≥15 sessions								
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	8.5%	0.52 [0.13, 0.90]
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.6%	0.21 [-0.70, 1.11]
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.2%	-0.14 [-0.77, 0.50]
Lüdemann-Podubecká 2015	49.9	14.6	9	51.1	15.9	8	1.4%	-0.07 [-1.03, 0.88]
Lüdemann-Podubecká 2015	51.4	14.7	11	48.8	17.1	12	1.9%	0.16 [-0.66, 0.98]
Sung 2013	30.4	11.8	12	28.7	13.1	14	2.2%	0.13 [-0.64, 0.90]
Sung 2013	35.4	16.1	13	28.7	13.1	14	2.2%	0.44 [-0.32, 1.21]
Sung 2013	30.9	10.3	15	28.7	13.1	14	2.4%	0.18 [-0.55, 0.91]
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.7%	0.29 [-0.40, 0.98]
Wang CP 2014	33.7	23.6	16	27.2	19.6	16	2.7%	0.29 [-0.41, 0.99]
Subtotal (95% CI)			175			177	28.8%	0.27 [0.06, 0.48]
Heterogeneity: Tau² = 0.00; Chi² = 4.14, df = 9 (P = 0.90); I² = 0%								
Test for overall effect: Z = 2.53 (P = 0.01)								
Total (95% CI)			628			635	100.0%	0.45 [0.33, 0.56]
Heterogeneity: Tau² = 0.00; Chi² = 47.47, df = 47 (P = 0.45); I² = 1%								
Test for overall effect: Z = 7.68 (P < 0.00001)								
Test for subgroup differences: Chi² = 8.93, df = 3 (P = 0.03), I² = 66.4%								

Favours [experimental]   Favours [control]

Fig S15. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sessions rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

| Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.5.1 bilateral								
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.6%	0.62 [-0.26, 1.50]
Sung 2013	30.9	10.3	15	28.7	13.1	14	2.4%	0.18 [-0.55, 0.91]
Sung 2013	35.4	16.1	13	28.7	13.1	14	2.2%	0.44 [-0.32, 1.21]
Sung 2013	30.4	118	12	28.7	13.1	14	2.1%	0.02 [-0.75, 0.79]
Wang CP 2014	33.6	23.1	17	27.2	19.6	16	2.7%	0.29 [-0.40, 0.98]
Wang CP 2014	33.7	23.6	15	27.2	19.6	16	2.5%	0.29 [-0.42, 1.00]
Subtotal (95% CI)			83			84	13.5%	0.29 [-0.01, 0.60]

Heterogeneity: Tau² = 0.00; Chi² = 1.24, df = 5 (P = 0.94); I² = 0%
Test for overall effect: Z = 1.88 (P = 0.06)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.5.2 unilateral								
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.6%	0.37 [-0.51, 1.25]
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.6%	0.44 [-0.44, 1.32]
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.3%	0.28 [-0.70, 1.27]
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.2%	0.88 [-0.13, 1.89]
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.0%	1.26 [0.47, 2.06]
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	8.6%	0.52 [0.13, 0.90]
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.4%	-0.01 [-0.73, 0.72]
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.0%	0.23 [-0.91, 1.37]
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.6%	0.21 [-0.70, 1.11]
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.3%	0.32 [-0.31, 0.94]
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.1%	0.68 [0.04, 1.31]
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.1%	0.29 [-0.79, 1.37]
Gillick 2014	5.8	2.8	10	1.9	2	9	1.1%	1.52 [0.47, 2.57]
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.2%	0.70 [0.08, 1.33]
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.2%	0.21 [-0.42, 0.84]
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.6%	1.87 [0.42, 3.32]
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.1%	-0.14 [-0.77, 0.50]
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.5%	0.73 [0.13, 1.33]
J,DU 2016	30.52	17.11	23	23.92	11.96	23	3.7%	0.44 [-0.15, 1.02]
Khedr 2009	57.7	26	12	31	47	12	1.9%	0.68 [-0.15, 1.51]
Khedr 2009	68.9	64	12	31	47	12	1.9%	0.65 [-0.17, 1.48]
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	1.8%	0.91 [0.08, 1.75]
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.0%	0.65 [-0.14, 1.44]
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.4%	2.05 [0.36, 3.75]
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.8%	0.42 [-0.84, 1.69]
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.4%	0.09 [-0.86, 1.05]
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	1.9%	0.32 [-0.50, 1.15]
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.6%	0.05 [-0.82, 0.93]
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.6%	0.12 [-0.78, 1.02]
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	1.6%	0.55 [-0.35, 1.45]
Nowak 2008	656	147	15	546	98	15		Not estimable
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.1%	0.19 [-0.90, 1.29]
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.4%	0.95 [0.01, 1.89]
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.2%	1.33 [0.28, 2.38]
Sung 2013	34.8	13.7	13	27.6	12.8	14	2.1%	0.53 [-0.24, 1.30]
Sung 2013	34.8	13.7	13	28.8	10.2	12	2.0%	0.48 [-0.32, 1.28]
Sung 2013	30.1	12.5	15	27.6	12.8	14	2.4%	0.19 [-0.54, 0.92]
Sung 2013	30.1	12.5	15	28.8	10.2	12	2.2%	0.11 [-0.65, 0.87]
Takeuchi 2005	142	27	10	120	15.5	10	1.4%	0.96 [0.02, 1.89]
Takeuchi 2008	120	21	10	101.7	13.7	10	1.4%	0.99 [0.05, 1.93]
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.0%	-0.18 [-0.99, 0.62]
Talelli 2012	74.5	18	13	63.4	26.4	12	2.0%	0.48 [-0.32, 1.28]
Theilig 2011	21	30.5	12	20	18.5	12	2.0%	0.04 [-0.76, 0.84]
Zhao 2017	34.25	15.09	8	20.55	11.7	8	1.2%	0.97 [-0.05, 1.99]
Subtotal (95% CI)			558			561	86.5%	0.49 [0.37, 0.61]

Heterogeneity: Tau² = 0.00; Chi² = 39.60, df = 42 (P = 0.58); I² = 0%
Test for overall effect: Z = 7.94 (P < 0.00001)

| Total (95% CI) | | | 641 | | | 645 | 100.0% | 0.46 [0.35, 0.58] |

Heterogeneity: Tau² = 0.00; Chi² = 42.21, df = 48 (P = 0.71); I² = 0%
Test for overall effect: Z = 8.07 (P < 0.00001)
Test for subgroup differences: Chi² = 1.37, df = 1 (P = 0.24), I² = 27.1%

Favours [control]   Favours [experimental]

Fig S16. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing different stimulation sites rTMS protocol showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

| Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
3.1.1 ≤30 days									
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.5%	0.28 [-0.70, 1.27]	
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	9.0%	0.52 [0.13, 0.90]	
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.6%	0.70 [0.08, 1.33]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.7%	1.87 [0.42, 3.32]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	3.9%	0.73 [0.13, 1.33]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	4.1%	0.44 [-0.15, 1.02]	
Khedr 2009	57.7	26	12	31	47	12	2.1%	0.68 [-0.15, 1.51]	
Khedr 2009	68.9	64	12	31	47	12	2.1%	0.65 [-0.17, 1.48]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.3%	0.65 [-0.14, 1.44]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	2.1%	0.91 [0.08, 1.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable	
Matsuura 2015	5.12	1.96	10	4.35	1.96	10	1.8%	0.38 [-0.51, 1.26]	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.3%	1.33 [0.28, 2.38]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.6%	0.95 [0.01, 1.89]	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.8%	0.62 [-0.26, 1.50]	
Subtotal (95% CI)			226			222	37.9%	0.65 [0.46, 0.84]	

Heterogeneity: Tau² = 0.00; Chi² = 7.07, df = 13 (P = 0.90); I² = 0%
Test for overall effect: Z = 6.65 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
3.1.2 >30 days									
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable	
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.8%	0.44 [-0.44, 1.32]	
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.9%	0.37 [-0.51, 1.25]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.4%	0.88 [-0.13, 1.89]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.3%	1.26 [0.47, 2.06]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.7%	-0.01 [-0.73, 0.72]	
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable	
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.1%	0.23 [-0.91, 1.37]	
DK Rose 2014	4.6	4.5	9	3.6	4.7	10	1.8%	0.21 [-0.70, 1.11]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.4%	0.68 [0.04, 1.31]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.6%	0.32 [-0.31, 0.94]	
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.2%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.3%	1.52 [0.47, 2.57]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.5%	0.21 [-0.42, 0.84]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.5%	-0.14 [-0.77, 0.50]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.9%	0.42 [-0.84, 1.69]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	2.1%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.6%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2016	-6.8	5.6	9	-7.7	8.1	10	1.8%	0.12 [-0.78, 1.02]	
Malcolm 2007	6.2	2.9	7	4.2	2.4	7	1.2%	0.70 [-0.39, 1.80]	
Mansur 2005	4.15	2.72	8	4.15	2.78	8		Not estimable	
Nowak 2008	5.17	3.71	6	4.14	5.73	7		Not estimable	
Pomeroy 2007	35.4	16.1	13	28.7	13.1	14	2.4%	0.44 [-0.32, 1.21]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable	
Sung 2013	30.4	11.8	12	28.7	13.1	14	2.4%	0.13 [-0.64, 0.90]	
Sung 2013	30.9	10.3	15	28.7	13.1	14	2.7%	0.18 [-0.55, 0.91]	
Takeuchi 2005	142	27	10	120	15.5	10	1.6%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.6%	0.99 [0.05, 1.93]	
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable	
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.2%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	2.2%	0.48 [-0.32, 1.28]	
Theilig 2011	21	30.5	12	20	18.5	12	2.2%	0.04 [-0.76, 0.84]	
Wang CP 2014	29.6	22.5	17	32.3	24	16	3.0%	-0.11 [-0.80, 0.57]	
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.8%	-0.08 [-0.78, 0.63]	
Zhao 2017	34.25	15.09	8	20.55	11.7	9	1.4%	0.97 [-0.05, 1.99]	
Subtotal (95% CI)			350			361	62.1%	0.36 [0.20, 0.52]	

Heterogeneity: Tau² = 0.01; Chi² = 31.16, df = 29 (P = 0.36); I² = 7%
Test for overall effect: Z = 4.47 (P < 0.00001)

| **Total (95% CI)** | | | 576 | | | 583 | 100.0% | 0.47 [0.35, 0.59] | |

Heterogeneity: Tau² = 0.00; Chi² = 43.91, df = 43 (P = 0.43); I² = 2%
Test for overall effect: Z = 7.62 (P < 0.00001)
Test for subgroup differences: Chi² = 5.31, df = 1 (P = 0.02), I² = 81.2%

Favours [control]   Favours [experimental]

Fig S17. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing early stroke(within 30 days) and chronic stroke(>30 days) showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.

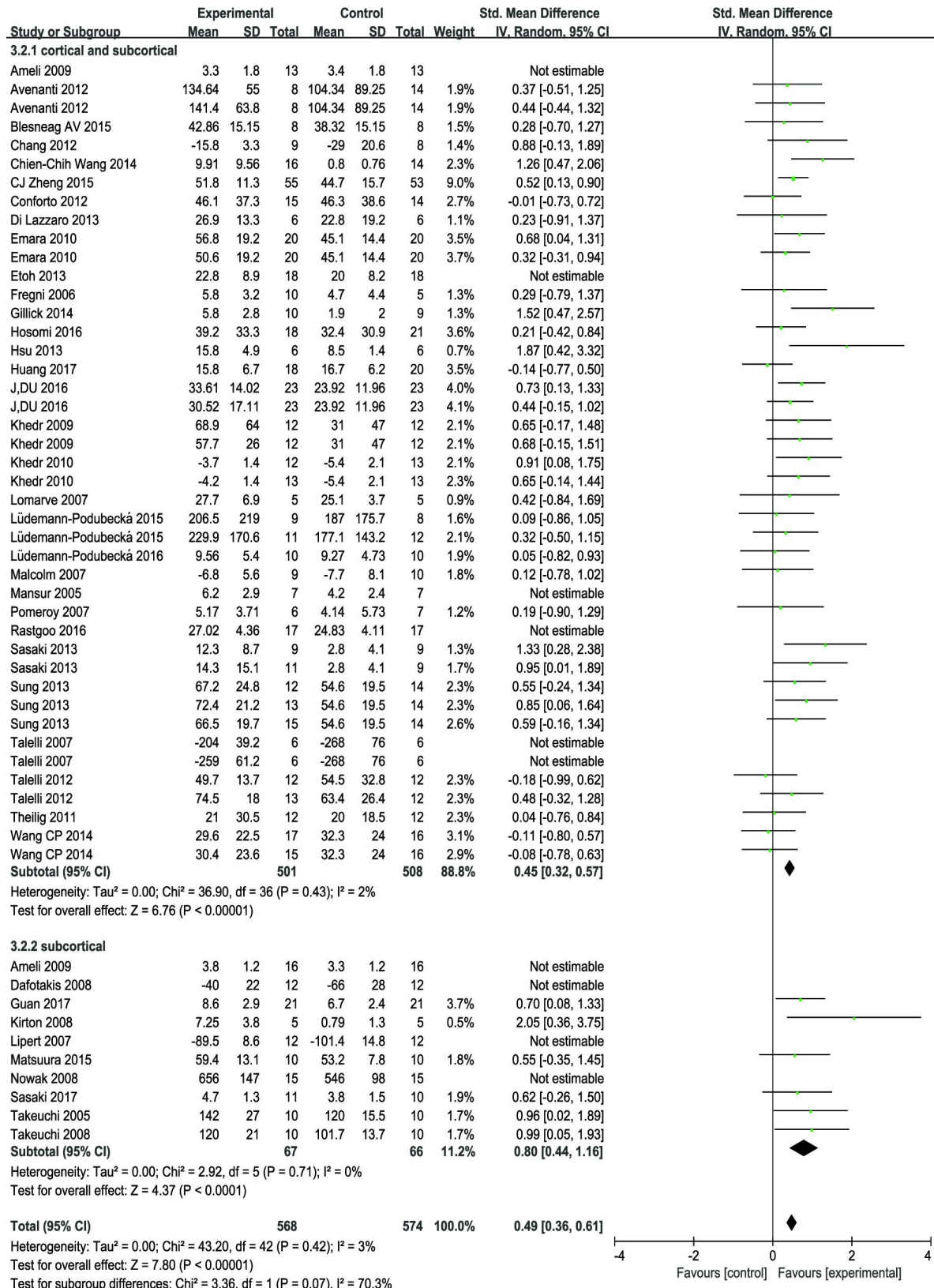| Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
3.2.1 cortical and subcortical									
Ameli 2009	3.3	1.8	13	3.4	1.8	13		Not estimable	
Avenanti 2012	134.64	55	8	104.34	89.25	14	1.9%	0.37 [-0.51, 1.25]	
Avenanti 2012	141.4	63.8	8	104.34	89.25	14	1.9%	0.44 [-0.44, 1.32]	
Blesneag AV 2015	42.86	15.15	8	38.32	15.15	8	1.5%	0.28 [-0.70, 1.27]	
Chang 2012	-15.8	3.3	9	-29	20.6	8	1.4%	0.88 [-0.13, 1.89]	
Chien-Chih Wang 2014	9.91	9.56	16	0.8	0.76	14	2.3%	1.26 [0.47, 2.06]	
CJ Zheng 2015	51.8	11.3	55	44.7	15.7	53	9.0%	0.52 [0.13, 0.90]	
Conforto 2012	46.1	37.3	15	46.3	38.6	14	2.7%	-0.01 [-0.73, 0.72]	
Di Lazzaro 2013	26.9	13.3	6	22.8	19.2	6	1.1%	0.23 [-0.91, 1.37]	
Emara 2010	56.8	19.2	20	45.1	14.4	20	3.5%	0.68 [0.04, 1.31]	
Emara 2010	50.6	19.2	20	45.1	14.4	20	3.7%	0.32 [-0.31, 0.94]	
Etoh 2013	22.8	8.9	18	20	8.2	18		Not estimable	
Fregni 2006	5.8	3.2	10	4.7	4.4	5	1.3%	0.29 [-0.79, 1.37]	
Gillick 2014	5.8	2.8	10	1.9	2	9	1.3%	1.52 [0.47, 2.57]	
Hosomi 2016	39.2	33.3	18	32.4	30.9	21	3.6%	0.21 [-0.42, 0.84]	
Hsu 2013	15.8	4.9	6	8.5	1.4	6	0.7%	1.87 [0.42, 3.32]	
Huang 2017	15.8	6.7	18	16.7	6.2	20	3.5%	-0.14 [-0.77, 0.50]	
J,DU 2016	33.61	14.02	23	23.92	11.96	23	4.0%	0.73 [0.13, 1.33]	
J,DU 2016	30.52	17.11	23	23.92	11.96	23	4.1%	0.44 [-0.15, 1.02]	
Khedr 2009	68.9	64	12	31	47	12	2.1%	0.65 [-0.17, 1.48]	
Khedr 2009	57.7	26	12	31	47	12	2.1%	0.68 [-0.15, 1.51]	
Khedr 2010	-3.7	1.4	12	-5.4	2.1	13	2.1%	0.91 [0.08, 1.75]	
Khedr 2010	-4.2	1.4	13	-5.4	2.1	13	2.3%	0.65 [-0.14, 1.44]	
Lomarve 2007	27.7	6.9	5	25.1	3.7	5	0.9%	0.42 [-0.84, 1.69]	
Lüdemann-Podubecká 2015	206.5	219	9	187	175.7	8	1.6%	0.09 [-0.86, 1.05]	
Lüdemann-Podubecká 2015	229.9	170.6	11	177.1	143.2	12	2.1%	0.32 [-0.50, 1.15]	
Lüdemann-Podubecká 2016	9.56	5.4	10	9.27	4.73	10	1.9%	0.05 [-0.82, 0.93]	
Malcolm 2007	-6.8	5.6	9	-7.7	8.1	10	1.8%	0.12 [-0.78, 1.02]	
Mansur 2005	6.2	2.9	7	4.2	2.4	7		Not estimable	
Pomeroy 2007	5.17	3.71	6	4.14	5.73	7	1.2%	0.19 [-0.90, 1.29]	
Rastgoo 2016	27.02	4.36	17	24.83	4.11	17		Not estimable	
Sasaki 2013	12.3	8.7	9	2.8	4.1	9	1.3%	1.33 [0.28, 2.38]	
Sasaki 2013	14.3	15.1	11	2.8	4.1	9	1.7%	0.95 [0.01, 1.89]	
Sung 2013	67.2	24.8	12	54.6	19.5	14	2.3%	0.55 [-0.24, 1.34]	
Sung 2013	72.4	21.2	13	54.6	19.5	14	2.3%	0.85 [0.06, 1.64]	
Sung 2013	66.5	19.7	15	54.6	19.5	14	2.6%	0.59 [-0.16, 1.34]	
Talelli 2007	-204	39.2	6	-268	76	6		Not estimable	
Talelli 2007	-259	61.2	6	-268	76	6		Not estimable	
Talelli 2012	49.7	13.7	12	54.5	32.8	12	2.3%	-0.18 [-0.99, 0.62]	
Talelli 2012	74.5	18	13	63.4	26.4	12	2.3%	0.48 [-0.32, 1.28]	
Theilig 2011	21	30.5	12	20	18.5	12	2.3%	0.04 [-0.76, 0.84]	
Wang CP 2014	29.6	22.5	17	32.3	24	16	3.1%	-0.11 [-0.80, 0.57]	
Wang CP 2014	30.4	23.6	15	32.3	24	16	2.9%	-0.08 [-0.78, 0.63]	
Subtotal (95% CI)			501			508	88.8%	0.45 [0.32, 0.57]	

Heterogeneity: Tau² = 0.00; Chi² = 36.90, df = 36 (P = 0.43); I² = 2%
Test for overall effect: Z = 6.76 (P < 0.00001)

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
3.2.2 subcortical									
Ameli 2009	3.8	1.2	16	3.3	1.2	16		Not estimable	
Dafotakis 2008	-40	22	12	-66	28	12		Not estimable	
Guan 2017	8.6	2.9	21	6.7	2.4	21	3.7%	0.70 [0.08, 1.33]	
Kirton 2008	7.25	3.8	5	0.79	1.3	5	0.5%	2.05 [0.36, 3.75]	
Lipert 2007	-89.5	8.6	12	-101.4	14.8	12		Not estimable	
Matsuura 2015	59.4	13.1	10	53.2	7.8	10	1.8%	0.55 [-0.35, 1.45]	
Nowak 2008	656	147	15	546	98	15		Not estimable	
Sasaki 2017	4.7	1.3	11	3.8	1.5	10	1.9%	0.62 [-0.26, 1.50]	
Takeuchi 2005	142	27	10	120	15.5	10	1.7%	0.96 [0.02, 1.89]	
Takeuchi 2008	120	21	10	101.7	13.7	10	1.7%	0.99 [0.05, 1.93]	
Subtotal (95% CI)			67			66	11.2%	0.80 [0.44, 1.16]	

Heterogeneity: Tau² = 0.00; Chi² = 2.92, df = 5 (P = 0.71); I² = 0%
Test for overall effect: Z = 4.37 (P < 0.0001)

Total (95% CI)			568			574	100.0%	0.49 [0.36, 0.61]	

Heterogeneity: Tau² = 0.00; Chi² = 43.20, df = 42 (P = 0.42); I² = 3%
Test for overall effect: Z = 7.80 (P < 0.00001)
Test for subgroup differences: Chi² = 3.36, df = 1 (P = 0.07), I² = 70.3%

Favours [control]   Favours [experimental]

Fig S18. Forest plot from the meta-analysis of rTMS on limb motor function for studies comparing pure subcortical stroke and including cortical stroke showing estimates of effect size (SMD) with 95% confidence intervals after the removal of the cross-over studies.