Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Badics et al., 2002 PEDro score: N/A	No Score (pre-post study)	Exercise program for restoring the extensor strength of the legs and the supporting strength of the arms Treatment program: 3 to 4 days per week for 4 weeks. 3 to 5 series with 20 repeats.	**At 4 weeks:** (+) Extensor strength of the legs (measured by amount of weight patients able to press) (-) Spasticity (Ashworth scale)
Bourbonnais et al., 2002 PEDro score: 5	5	6-week force feedback program of upper paretic limb vs. force feedback program of lower paretic limb *Both groups served as each other's control group	**Lower extremity treatment group*:** (+) Gait velocity (+) 2-minute walk test (+) Strength of the lower limb (-) TUG (-) Fugl-Meyer for lower limb (-) Pain (-) Ankle spasticity **Upper extremity treatment group*:** (+) Strength of the upper limb (-) Test évaluant la Performance des Membres supérieurs des Personnes âgées (-) Fugl-Meyer for the upper limb (-) Finger to nose test (-) Pain (-) Spasticity NOTE: *as compared to the other group over time and not just the comparison to baseline.
Cooke et al., 2010 PEDro score: 8	8	Conventional physiotherapy (CPT, n=38) Vs.	**CPT+FST group vs. CPT group at 6 weeks (post-treatment)** (-) Walking speed (10 Minute Walk Test or VICON movement analysis system)

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
		Extra intensity physiotherapy (CPT+CPT, n=35) Vs. Conventional physiotherapy + functional strength training (CPT+FST, n=36) Treatment program: Up to 1 hour/day, four days a week for 6 weeks	(-) Community mobility (walking at or faster than 0.8m/sec) (-) Knee extension torque (isokinetic dynamometer) (-) Knee flexion torque (isokinetic dynamometer) (-) Modified Rivermead mobility index (-) symmetry of step length (-) symmetry of step time (-) Health status and health-related quality of life (EuroQuoL) **CPT+FST group vs. CPT group at 18 weeks (follow-up)** (-) Walking speed (10 Minute Walk Test or VICON movement analysis system) (-) Community mobility (walking at or faster than 0.8m/sec) (-) Knee extension torque (isokinetic dynamometer) (-) Knee flexion torque (isokinetic dynamometer) (-) Modified Rivermead mobility index (-) symmetry of step length (-) symmetry of step time (-) Health status and health-related quality of life (EuroQuoL) **CPT+CPT group vs. CPT group at 6 weeks (outcome)**

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			(+) Walking speed (10 Minute Walk Test or VICON movement analysis system) (+) Community mobility (walking at or faster than 0.8m/sec) (-) Knee extension torque (isokinetic dynamometer) (+) Knee flexion torque (isokinetic dynamometer) (-) Modified Rivermead mobility index (-) symmetry of step length (-) symmetry of step time (-) Health status and health-related quality of life (EuroQuoL) **CPT+CPT group vs. CPT group at 18 weeks (follow-up)** (-) Walking speed (10 Minute Walk Test or VICON movement analysis system) (-) Community mobility (walking at or faster than 0.8m/sec) (-) Knee extension torque (isokinetic dynamometer) (-) Knee flexion torque (isokinetic dynamometer) (-) Modified Rivermead mobility index (-) symmetry of step length (-) symmetry of step time (-) Health status and health-related quality of life (EuroQuoL)

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Cramp et al., 2006 PEDro score: N/A	No Score (pre-post study)	Low intensity strength training program Treatment program: 2 sessions per week for 6 months (length of sessions unspecified)	**At 6 months (immediately post intervention)** and at 4- to 6- week follow up: (+) Walking speed (self selected pace) (+) Isometric and concentric strength of knee extensor muscles (-) Knee flexor muscle strength (-) Spasticity (Ashworth scale)
Dean et al. 2000 PEDro score: 5	5	Strengthening the affected lower limb and practicing functional tasks involving the lower limbs vs. upper limb tasks	(+) Walking speed (+) Walking endurance (6-minute walk test) (+) Force production through the affected leg during sit-to-stand (+) Repetitions of the step test
Glasser, 1986 PEDro score: 4	4	Therapeutic exercise program and gait training + isokinetic exercise vs. therapeutic exercise program and gait training	(-) Functional Ambulation Profile (-) Ambulation time
Inaba et al., 1973 PEDro score: 4	4	Functional training and selective stretching (control) vs. active exercises in addition to functional training and selective stretching vs. progressive resistance training and selective stretching	Progressive resistance training group:: (+) Activities of daily living (ADL) (+) Strength
Kim et al. 2001 PEDro score: 6 (RCT)	7	Maximal isokinetic strengthening (6 weeks) vs. passive range of motion (PROM)	(-) Self-selected gait speed (-) Maximal gait speed (-) Self-selected stair-climbing speed (-) Maximal stair-climbing speed (-) SF-36 (physical health) (-) SF-36 (mental health)

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Lee et al., 2008 PEDro score: 8	8	Aerobic cycling + progressive resistance training (PRT) (n=14) vs. Aerobic cycling + sham PRT (n=13) vs. Sham cycling + PRT (n=13) vs. Sham cycling + Sham PRT (n=12) Training program: 30 x 1-hour sessions over 10 to 12 weeks	**At 10 to 12 weeks (immediately post intervention):** Effect of strength training (the adjusted difference in outcomes between the PRT and sham PRT groups): (+) Stair climbing power (W) (+) Peak power output on a cycle ergometer, (+) Lower extremity strength, power and endurance in both legs measured by weight lifting ability. (-) Gait endurance (measured by the 6 minute walk test) (-) Fast or habitual gait speed (-) Peak VO2 and peak heart rate (measured by test of maximal effort on a cycle ergometer) (-) quality of life (measured by the Medical Outcomes Short Form - 36 items) (-) Perceived self-efficacy in functional mobility (measured by the Ewart Self-Efficacy Scales for stair climbing and walking).
Moreland et al. 2003 PEDro score: 6	6	Progressive lower-limb resistance training for the duration of their stay vs.conventional therapy (control)	(-) Disability Inventory of the Chedoke-McMaster Stroke Assessment (-) 2-minute walk test (-) Spasticity (Ashworth Scale)

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Nugent et al., 1994 PEDro score: No Score	No score	Weight-bearing exercises	N/A - For patients who were initially able to stand on their affected leg and step forward with their other leg, a dose-response relationship was found between an increasing number of repetitions of the weight-bearing exercises and improved walking outcome as measured on the Motor Assessment Scale
Ouellette et al., 2004 PEDro score: 7	7	Lower-extremity progressive resistance training program (12 weeks) vs. upper extremity stretching	(+) Late Life Function and Disability Instrument (-) 6-minute walk (-) Stair-climb time (-) Repeated chair-rise time (-) Habitual and maximal gait velocities (+) Leg press strength (+) Knee extension strength
Page et al., 2008 PEDro score: 4	4	Resistance-based, reciprocal, affected leg loco-motor training protocol using the NuStep apparatus. Vs. Self-supervised practice with fractionated joint movements of the lower limb (control). Treatment: 3 x 30-minute sessions per week for 8 weeks. Each patient received both treatments in a random order.	**Immediately post intervention (after 8 weeks of each intervention):** Pre-post average change following NuStep strength-training: (+) Lower extremity scale of the Fugl-Meyer Assessment (FMA) (change of +2.7) (+) Berg Balance Scale (BBS) (change of +4.0) Pre-post average change following non-strength-training: (+) Lower extremity scale of the FMA (change of only +.4) (-) BBS

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Sharp and Brouwer, 1997 PEDro score: No score	no score	6-week isokinetic exercise program consisting of knee extension and flexion	(+) Paretic muscle strength (-) Timed Up and Go (TUG) (-) Stair-climbing (+) Gait velocity Tone remained consistent
Sullivan et al., 2006 PEDro score: N/A	No Score (single-case study)	Body-weight supported treadmill training + limb-loaded cycling Treatment: 4 x 1 hour sessions per week for 6 weeks.	**At 6 weeks (immediately post intervention):** (+) Lower extremity scale of the Fugl-Meyer Assessment (FMA) (-) Berg Balance Scale (BBS) (slight decrease) (+) Walking speed (self selected pace) (+) 6-min walking distance (+) Correlation of gait improvement with magnitude of paretic leg gluteus maximus and gluteus medius activation during gait (measured by EMG) (+) Hip and knee extension motions throughout stance and swing while walking (-) Ankle motion throughout walking. **At 6-month follow-up:** (-) BBS (small increase back to baseline level) (-) Lower extremity scale of the FMA (maintained improvements from 6-weeks post treatment) (+) Walking speed (self selected pace) (+) 6-min walking distance (+) Strength, mobility, emotion, and social participation sub-scales of the Stroke Impact Scale (SIS) compared to baseline

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			(-) Hand function, activities of daily living (ADL), communication, memory and thinking subscales of the SIS compared to baseline
Sullivan et al., 2007 PEDro score: 7	7	Body-weight-supported treadmill training (BWSTT) + Limb-loaded resistive leg cycling (CYCLE) (n=20) vs. BWSTT + Lower extremity muscle-specific progressive-resistive exercise (LE-EX) (n=20) vs. BWSTT + Upper-extremity ergometry (UE-EX) (n=20) vs. CYCLE + UE-EX (n=20)	**At 6 weeks (immediately post intervention) and at 6-month follow-up:** BWSTT/UE-EX vs. CYCLE/UE-EX (+) Self-selected walking speed (+) Fast walking speed (-) 6-minute walk distance NOTE: When combined with BWSTT, the strength training regimens (LE-EX and CYCLE) did not add any additional benefits, compared to BWSTT/UE-EX.

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
		Treatment program: 4 x 1-hour sessions per week for 6 weeks.	
Teixeria-Salmela et al., 1999 PEDro score: 5	5	10-week lower limb training program vs. no intervention	(+) Nottingham Health Profile (+) Adjusted Activity Scale (AAS) (+) Human Activity Profile (HAP) (+) Strength of the affected major muscle groups (+) Gait speed (+) Rate of stair climbing (-) Spasticity of knee extensors (measured by the pendulum test) and ankle plantar flexors (measured using controlled resistance to ankle movements).
Weiss et al., 2000 PEDro score: no score	No score	12-week resistance training program	(+) Lower Limb Strength Lower limb strength was associated with gains in chair stand time, balance (Berg Balance Test), and motor performance (Motor Assessment Scale).
Yang et al., 2006 PEDro score: N/A	7	Progressive task-oriented resistance program for the lower extremity (n=24) vs. No treatment (control) (n=24)	**At 4 weeks (immediately post intervention):** (+) Strength of the lower extremities (measured by a hand-held dynamometer) (+) Walking speed (self selected) (+) Cadence (+) Stride length (+) 6-minute walk test (-) Balance (step test)

Strength Training – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
		Treatment program: 3 x 30-minute sessions per week, for 4 weeks	(+) Time Up and Go