

Task-Oriented Training – upper extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Arya et al. (2012). PEDro score: 9	103 patients with subacute stroke	<p>Meaningful task-specific training (MTST, n=51)</p> <p>Vs.</p> <p>Standard training based on Brunnstrom movement therapy and Bobath neurodevelopmental therapy (n=52)</p> <p>Treatment details: 60 minutes, 4-5 times/week for 4 weeks</p>	<p>At 8 weeks:</p> <p>(+) Fugl-Meyer Assessment (FMA) - upper extremity</p> <p>(+) FMA - upper arm</p> <p>(+) FMA - wrist and hand</p> <p>(+) Action Research Arm Test (ARAT) – overall score</p> <p>(+) ARAT – grasp</p> <p>(+) ARAT – grip</p> <p>(+) ARAT – pinch</p> <p>(+) ARAT - gross arm movement</p> <p>(+) Graded Wolf Motor Function Test (GWMFT) - time</p> <p>(+) GWMFT - quality of movement</p> <p>(+) Motor Activity Log (MAL) - amount of use</p> <p>(+) MAL - quality of movement</p> <p>Note: All results depict significant between-group difference in change scores at 8 weeks (follow-up). Statistical data for between-group differences in scores at 4 weeks (post-treatment) and 8 weeks (follow-up) was not provided.</p>
Baskett et al., (1999). PEDro score: 8	100 patients with subacute stroke	<p>Functional self-directed home-based therapy (n=50)</p> <p>Vs.</p> <p>Conventional rehabilitation (n=50).</p>	<p>At 6 weeks:</p> <p>(-) Motor Assessment Scale</p> <p>(-) Frenchay Arm Test</p> <p>(-) modified Barthel Index</p> <p>(-) Nine Hole Peg Test</p> <p>(-) grip strength</p>

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		<p>Treatment details: Functional training comprised weekly home visits by a physiotherapist and occupational therapist (average 8.75 hours of therapy / 9 visits)</p> <p>Conventional rehabilitation comprised physiotherapy and occupational therapy at a day hospital program or hospital department (average 11.3 hours of therapy / 10 visits).</p>	<p>(-) 10-meter walking speed test (-) Hospital Anxiety and Depression Scale (-) General Health Questionnaire (GHQ-28)</p> <p>At 3 months: (-) Motor Assessment Scale (-) Frenchay Arm Test (-) modified Barthel Index (-) Nine Hole Peg Test (-) grip strength (-) 10-metre walking speed test (-) Hospital Anxiety and Depression Scale (-) General Health Questionnaire (GHQ-28)</p>
Christie et al., (2011) PEDro score: n/a (pre-post single group study)	119 patients with acute stroke	<p>Group-based task-specific dressing retraining program</p> <p>Treatment details: 1 hour, 2 times per week during admission (average 4 sessions), in addition to individual occupational therapy.</p>	<p>At discharge: (+) FIM upper body dressing* (+) FIM lower body dressing* (+) FIM upper and lower body dressing*</p> <p>* denotes within-group difference</p>
Corti et al., (2012) PEDro score: 7 (randomized crossover design study)	14 patients with chronic stroke	<p>Functional task practice (FTP) n=8</p> <p>Vs.</p> <p>Dynamic high-intensity resistance training (POWER) n=6.</p> <p>Treatment details: Individual 90-minute sessions, 3 times/week for 10 weeks.</p>	<p>At 10 weeks: (-) Modified Ashworth Scale (MAS) – shoulder abduction (-) MAS – shoulder flexion/extension (-) MAS – elbow flexion/extension (-) MAS – wrist flexion/extension (-) Fugl-Meyer Assessment of the Upper Extremity (FMA-UE) - Motor Score (-) FMA-UE - shoulder/elbow</p>

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Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			<p>(-) European Stroke Scale (-) Chedoke-McMaster Hand and Arm Inventory (-) Reintegration to Normal Living Index</p> <p>Kinematics: (-) mean velocity (-) reach-path ratio and submovements (-) time to peak hand velocity (-) time to maximum shoulder flexion (-) time to maximum elbow extension (-) shoulder flexion ROM (+) elbow extension ROM* (+) trunk displacement*</p> <p>At 20 weeks: (-) MAS – shoulder abduction (-) MAS – shoulder flexion/extension (-) MAS – elbow flexion/extension (-) MAS – wrist flexion/extension (-) FMA-UE - Motor Score (-) FMA-UE - shoulder/elbow (-) European Stroke Scale (-) Chedoke-McMaster Hand and Arm Inventory (-) Reintegration to Normal Living Index</p> <p>Kinematics: (+) mean velocity (-) reach-path ratio and submovements (-) time to peak hand velocity (-) time to maximum shoulder flexion</p>

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Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			(-) time to maximum elbow extension (-) shoulder flexion ROM (-) elbow extension ROM (+) trunk displacement* * in favour of POWER vs. FTS
Liu et al., (2004). PEDro score: 6	49 patients with acute stroke (average 12-15 days post-stroke onset at recruitment)	Functional task training (n=22) Vs. Mental imagery (n=27) Treatment details: 1-hour sessions 5 days/week for 3 weeks.	At 1 week (mid-treatment): (-) Fugl-Meyer Assessment (FMA) - upper extremity motor function (-) FMA - lower extremity motor function (-) FMA -sensation (-) Color Trails Test (CTT) (-) Perceived task performance - trained tasks (7-point Likert scale) At 2 weeks (mid-treatment): (-) FMA - upper extremity motor function (-) FMA - lower extremity motor function (-) FMA -sensation (-) CTT (+) Perceived task performance - trained tasks* At 3 weeks (post-treatment): (-) FMA - upper extremity motor function (-) FMA - lower extremity motor function (-) FMA -sensation (-) CTT (+) Perceived task performance - trained tasks*

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Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			(+) Perceived task performance - untrained tasks (7-point Likert scale)* At 1-month follow-up: (-) FMA - upper extremity motor function (-) FMA - lower extremity motor function (-) FMA -sensation (-) CTT (+) Perceived task performance - trained tasks* * in favour of mental imagery compared to functional task training.
Widén Holmqvist et al., (1998). Pedro score: 6 (population-based RCT)	81 patients with subacute stroke	Task-oriented home rehabilitation (n=41) Vs. Conventional outpatient rehabilitation (n=40) Treatment details: Task-oriented home rehabilitation: average discharge 14 days post-stroke; mean of 10 home visits per patient over 3-4 month period; at-home rehabilitation focused on guided, supervised or self-directed activities in a functional and familiar context. Conventional rehabilitation: average discharge 29 days post-stroke; rehabilitation provided in hospital or day hospital setting.	At 3 months: (-) Katz Index of Independence in Activities of Daily Living (ADLs) – personal ADLs (-) Katz Index of Independence in ADLs – instrumental ADLs (-) Barthel Index (-) Frenchay Activities Index (-) Fugl-Meyer Assessment (FMA) - arm (-) FMA – leg (+) FMA – coordination (-) FMA – mobility (-) FMA – balance (-) FMA – total (-) Nine Hole Peg Test (-) 10 metre walking test (-) use of a walking aid (-) number of falls

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		Both groups received physical therapy, occupational therapy, speech pathology and social work support.	(-) Norsk Grunntest for Afasi (+) Sickness Impact Profile* *Psychosocial dimension emotional behaviour and communication scores only, in favour of conventional rehabilitation
Arya et al. (2012). PEDro score: 9	103 patients with subacute stroke	Meaningful task-specific training (MTST, n=51) Vs. Standard training based on Brunnstrom movement therapy and Bobath neurodevelopmental therapy (n=52) Treatment details: 60 minutes, 4-5 times/week for 4 weeks	At 8 weeks: (+) Fugl-Meyer Assessment (FMA) - upper extremity (+) FMA - upper arm (+) FMA - wrist and hand (+) Action Research Arm Test (ARAT) – overall score (+) ARAT – grasp (+) ARAT – grip (+) ARAT – pinch (+) ARAT - gross arm movement (+) Graded Wolf Motor Function Test (GWMFT) - time (+) GWMFT - quality of movement (+) Motor Activity Log (MAL) - amount of use (+) MAL - quality of movement Note: All results depict significant between-group difference in change scores at 8 weeks (follow-up). Statistical data for between-group differences in scores at 4 weeks (post-treatment) and 8 weeks (follow-up) was not provided.

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Blennerhassett & Dite, 2004 PEDro score: 8	30 acute and subacute	Upper extremity task-oriented training + Standard rehabilitation (n=15) vs. Lower extremity task-oriented mobility training + Standard rehabilitation (control) (n=15) Treatment details: Both groups received task-oriented training 1 hour a day x 5 days x 4 weeks	Immediately post-intervention (at 4 weeks) and at 6 months: Upper limb group vs. mobility group (control): (-) Jebsen Taylor Hand Function Test (dexterity scores only) (-) Motor Assessment Scale (upper arm items) (-) Six Minute Walk Test (-) Timed-Up-and-Go (-) Step Test
Higgins et al. 2006 PEDro score: 8	91 chronic stroke	Upper extremity task-oriented training (n=47) vs. Lower extremity task-oriented training (control) (n=44) Treatment details: Both groups received 3 x 90-minute sessions per week over 6 weeks	At 6 weeks (immediately post-intervention): (-) Box & Block test (-) Nine-hole peg test, (-) Upper Extremity Performance Test for the Elderly (TEMPA) (-) Grip strength (Jamar dynamometer) (-) Medical Outcomes Short Form-36 (SF-36) – upper extremity items (-) The upper extremity subscale of the Stroke Rehabilitation Assessment of Movement (STREAM-upper extremity) (-) Barthel Index – upper extremity subscale

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Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
			(-) The Older Americans Resources and Services Scale - Instrumental Activities of Daily Living (OARS-IADL) – upper extremity items (-) Geriatric Depression Scale
Langhammer et al., 2000 PEDro score: 6	61 acute stroke	Full body task-oriented training program (n=33) vs. Bobath-based treatment (control) (n=28) Treatment details: Both treatments consisted of 40 minutes of the respective method, 5 days per week.	At 2 weeks: (-)* Motor Assessment Scale (-)* Sjødring Motor Evaluation Scale – arm subscale (-) Sjødring Motor Evaluation Scale –leg and mobility subscales (-) Barthel Index (-) Nottingham Health Profile (quality of life) At 3 months: (-) Motor Assessment Scale (-) Sjødring Motor Evaluation Scale –arm subscale (-) Sjødring Motor Evaluation Scale –leg and mobility subscales (-) Barthel Index (-) Nottingham Health Profile *A between-group significant difference that approached significance was found.
Thielman et al., 2004 PEDro score: 4	12 chronic stroke	Upper extremity task-oriented training for grasping (n=6) vs. Upper extremity progressive resistive exercises	At 4 weeks: (-)* Arm trajectory (measured by kinematics) (-) Trunk compensation (measured by kinematics) (-) Motor Assessment Scale -upper extremity score

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		(n=6) Treatment details: Both groups received 12 x 35-minute sessions over 4 weeks	(-)* Rivermead Motor Assessment –arm section * This study may not have been sufficiently powered to find significant between-group differences and it should be noted that within-group improvements were found for those with low-level function in the intervention group, but not in the control group.
Thielman et al., 2008 PEDro score: 6	11 chronic stroke	Upper extremity task-oriented training with trunk restraint Vs. Resistive exercise training with trunk restraint Treatment Details: For both groups, training consisted of a 3 x 45-minute sessions per week for 4 weeks.	At 4 weeks: (-) Fugl-Meyer Assessment –upper arm score (-)* Arm trajectory (kinematics) (+) Trunk compensation (kinematics) (-) Wolf Motor Arm Test Range of motion (-) Elbow Extension (-) Shoulder Strength * This study may not have been adequately powered to find significant results and further analysis revealed significant within-group improvements for those in the intervention group, but not in the control group.
Van Vliet et al., 2005 PEDro score:6	120 acute stroke	Full body task-oriented training program (n=60) vs. Bobath based training	At 1, 3 and 6 months: (-) Rivermead Motor Assessment (-) Motor Assessment Scale (-) Barthel Index (-) Extended Activities of Daily Living Scale (-) Ten hole peg test

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		(control) (n=60) Treatment details: The amount of treatment given daily was matched to the amount given by existing ward physiotherapists and treatment continued for as long as was needed	(-) 6 m walk test (-) Modified Ashworth Scale (-) Nottingham Sensory Assessment
Winstein et al., 2004 PEDro score: 6	64 acute stroke	TOT: Upper extremity task-oriented training + Standard care (intervention) (n=22) vs. ST: Strength training + Standard care (intervention) (n=21) vs. SC: Standard care only (control) (n=21) Treatment details: In addition to standard care (duration and intensity were not printed in the study) both intervention groups received 5 x 1-hour sessions per week over 4-6 weeks, for a total of 20 hours of additional therapy.	At 4-6 weeks: All results below are based on TOT vs. SC, unless indicated otherwise Less Severe patients (based on Orpington Prognostic Scale [OPS]) (n=40): (+)* Fugl-Meyer -Upper Extremity Motor Function (-) Fugl-Meyer -Upper Extremity Pain (-) Fugl-Meyer -Upper Extremity Sensory (-) Fugl-Meyer -Upper Extremity Range of Motion (-) Functional Test of the Hemiparetic Upper Extremity (-) Isometric torque (-) Grasp force (-) Pinch force (-) Functional Independence Measure More severe OPS (n=20): (-) No differences found for any outcome measures above. At long-term follow up (9 months): Less Severe OPS (n=40):

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			<p>(-) Fugl-Meyer - Upper Extremity Motor Function (-) Fugl-Meyer - Upper Extremity Pain (-) Fugl-Meyer - Upper Extremity Sensory (-) Fugl-Meyer - Upper Extremity Range of Motion (-) Functional Test of the Hemiparetic Upper Extremity (+)** Isometric torque (-) Grasp force (+) Pinch force (-) Functional Independence Measure More severe OPS (n=20): (-) No differences found for any outcome measures (see outcome measures above) *It should be noted that there was also a significant difference between ST compared to SC (control) in favour of ST (p<.05), and that no significant difference was found between TOT and ST. **A significant difference was found here only between TOT and ST in favour of TOT.</p>