

Mirror Therapy – lower extremity

Author, Year PEDro Score, Country	Sample size	Intervention	Outcome and significance: (+) significant (-) not significant
Abo Salem & Huang, 2015 PEDro: 4/10 Country: China	30 patients with chronic stroke	Lower extremity mirror therapy (n=15) Vs. Sham mirror therapy (n=15) <u>Treatment details:</u> 15 minutes/session, 5 days/week for 4 weeks. <i>Mirror therapy:</i> participants observed the less-affected lower extremity in a mirror while seated to perform bilateral symmetrical movements: (i) hip-knee-ankle flexion; (ii) ankle dorsiflexion; and (iii) ankle eversion. <i>Sham mirror therapy:</i> participants followed the same treatment regime, with the non-reflective side of the mirror facing the non-paretic limb. Both groups also received conventional rehabilitation for 2-5 hours/day, 5 days/week that comprised occupational therapy, physical therapy, electrotherapy, neurodevelopmental facilitation techniques and gait training.	At post-treatment (4 weeks): (+) Passive range of motion – ankle dorsiflexion (+) Brunnstrom stages of motor recovery – Lower extremity (+) 10 Meter Walk Test (-) Modified Ashworth Scale – ankle plantarflexion
Arya, Pandian & Kumar, 2017 PEDro: 8/10 Country: India	36 patients with chronic stroke	Lower extremity mirror therapy (n=19) Vs. Conventional rehabilitation (n=17) <u>Treatment details:</u> 30 minutes/session, 3-4 sessions/week (total 30 sessions) over 3 months. <i>Mirror therapy:</i> participants watched the non-paretic limb in a mirror while performing unilateral activity-based movements (e.g. ball-rolling, rockerboard, pedalling, wiping) to promote hip internal/external rotation and abduction, knee flexion/extension, ankle plantar/dorsiflexion and inversion/eversion and toe	At 3 months (post-treatment): (-) Brunnstrom stages of motor recovery – Lower extremity (+) Fugl-Meyer Assessment – Lower Extremity (+) Rivermead visual gait assessment (-) 10 Meter Walk Test

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		<p>movements. Participants also received 30 minutes conventional rehabilitation.</p> <p><i>Conventional rehabilitation:</i> participants received time-matched intervention following Brunnstrom and Bobath principles.</p>	
<p>Ji et al., 2014 PEDro: 5/10 Country: Korea</p>	<p>30 patients with subacute/chronic stroke</p>	<p>Lower extremity mirror therapy (n=10) Vs. Lower extremity mirror therapy + Functional Electrical Stimulation (FES) (n=10) Vs. Sham mirror therapy (n=10)</p> <p><u>Treatment details</u> 20 minutes/session, 5 days/week for 6 weeks</p> <p><i>Mirror therapy:</i> participants watched the non-paretic leg in a mirror while performing simultaneous bilateral active dorsiflexion for 10 secs, then 5 secs rest.</p> <p><i>Mirror therapy + FES:</i> participants received microstimulation through electrodes that were activated as soon as the affected foot came off the ground during active dorsiflexion.</p> <p><i>Sham mirror therapy:</i> participants followed the same treatment regime as mirror therapy, with the reflective side of the mirror covered with cloth.</p> <p>All groups also received proprioceptive neuromuscular facilitation neurodevelopmental therapy for 30 minutes/session, 5 days/week for 6 weeks.</p>	<p>At post-treatment (6 weeks):</p> <p><i>Mirror therapy vs. Sham mirror therapy:</i> (+) Velocit (-) Cadence (-) Step length (-) Stride length</p> <p><i>Mirror therapy + FES vs. Sham mirror therapy:</i> (+) Velocity (-) Cadence (+) Step length (+) Stride length</p> <p><i>Mirror therapy vs. Mirror therapy + FES</i> (-) Velocity (-) Cadence (-) Step length (-) Stride length</p>

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Ji & Kim, 2014 PEDro: 7/10 Country: Korea	34 patients with subacute stroke	Lower extremity mirror therapy (n=17) Vs. Sham mirror therapy (n=17) <u>Treatment details:</u> 15 minutes/session, 5 days/week for 4 weeks <i>Mirror therapy:</i> participants watched the non-paretic leg in a mirror while performing unilateral lower extremity exercises – (i) hip-knee-ankle flexion, (ii) knee extension with ankle dorsiflexion, and (iii) knee flexion beyond 90 degrees. <i>Sham mirror therapy:</i> participants followed the same treatment regime, with the reflective side of the mirror covered with fabric. Both groups also received conventional rehabilitation that comprised neurodevelopmental facilitation techniques for 30 minutes/session, 5 days/week for 4 weeks.	At post-treatment (4 weeks): (+) Single stance (+) Step length (+) Stride length (-) Stance phase (-) Swing phase (-) Velocity (-) Cadence (-) Step width
Kawakami et al., 2015 PEDro: 3/10 Country: Japan	81 patients with acute/subacute stroke	Lower extremity mirror therapy (n=16) Vs. Integrated volitional-control electrical stimulation (n=19) Vs. Therapeutic electrical stimulation (n=15) Vs. Repetitive facilitative exercises (n=9) Vs. Facilitated movement (n=8) <u>Treatment details:</u> 20 minutes/day for 4 weeks.	At post-treatment (4 weeks): (-) Stroke Impairment Assessment Set – Hip flexion (-) Stroke Impairment Assessment Set – Knee extension (-) Stroke Impairment Assessment Set – Foot pat

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		<p><i>Mirror therapy:</i> participants watched the non-paretic lower limb in a mirror while performing repetitive ankle dorsiflexion, stepping over, and hip abduction/ adduction.</p> <p><i>Integrated volitional-control electrical stimulation:</i> low frequency electrical stimulation with 50 μs pulse width, 20 Hz frequency was applied on ankle dorsiflexion and knee extension of the paretic side using the Power Assist Stimulator system; electrode was attached to the anterior tibial muscle on ankle dorsiflexion and rectus femoris and medial great muscles on knee extension.</p> <p><i>Therapeutic electrical stimulation:</i> electrical stimulation with 50 μs pulse width, 20 Hz frequency was applied at the maximum acceptable intensity during 10 minutes each of paralytic ankle dorsiflexion and knee extension exercises.</p> <p><i>Repetitive facilitative exercises:</i> participants performed ankle dorsiflexion 100+ times over 10 minutes using manual tapping stimulation; and combined hip flexion/extension, abduction/adduction, external rotation and knee extension movements for 10 minutes.</p> <p><i>Facilitated movement:</i> passive range of motion and active assistive movement.</p>	
Mohan et al., 2013 PEDro: 4/10 Country: India	22 patients with acute stroke	<p>Lower extremity mirror therapy (n=11) vs. Sham mirror therapy (n=11)</p> <p><u>Treatment details:</u> 30 minutes/session, 6 days/week for 2 weeks.</p> <p><i>Mirror therapy:</i> participants watched the non-paretic limb in a mirror while performing unilateral repetitive</p>	<p>At 2 weeks (post-treatment): (-) Fugl-Meyer Assessment – Lower Extremity (-) Brunel Balance Assessment (+) Functional Ambulation Categories</p>

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		<p>functional synergy movements in (a) a half-lying position – hip-knee-ankle flexion, knee in/out, hip abduction with external rotation, hip adduction with internal rotation; and (b) sitting position – (i) hip-knee-ankle flexion, (ii) knee extension with ankle dorsiflexion, (iii) knee flexion beyond 90 degrees.</p> <p><i>Sham mirror therapy:</i> participants followed the same treatment regime, with the non-reflective surface of the mirror facing the non-paretic limb.</p> <p>Both groups also received conventional stroke rehabilitation for 60 minutes/day, 6 days/week for 2 weeks.</p>	
<p>Sutbeyaz et al., 2007 PEDro: 7/10 Country: USA</p>	40 patients with subacute stroke	<p>Lower extremity mirror therapy (n=20) Vs. Sham mirror therapy (n=20)</p> <p><u>Treatment details:</u> 30 minutes/day, 5 days/week for 4 weeks.</p> <p><i>Mirror therapy:</i> participants watched the non-paretic limb in a mirror while performing unilateral ankle dorsiflexion.</p> <p><i>Sham mirror therapy:</i> participants followed the same treatment regime using the non-reflective side of the mirror.</p> <p>Both groups also received conventional rehabilitation for 2-5 hours/day, 5 days/week.</p>	<p>At 6 months (follow-up): (+) Brunnstrom stages of motor recovery – Lower limb (+) Functional Independence Measure – Motor (-) Modified Ashworth Scale (-) Functional Ambulation Categories Note: between-group differences not provided at post-treatment (4 weeks).</p>
<p>Wang et al., 2017 PEDro: 4/10 Country: China</p>	36 patients with acute/subacute stroke	<p>Lower extremity mirror therapy (n=18) Vs. Sham mirror therapy (n=18)</p>	<p>At post-treatment (6 weeks): (+) Brunnstrom stages of motor recovery (+) Functional Ambulation Categories (+) Functional Independence Measure –</p>

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		<p><u>Treatment details:</u> 40 minutes/session, 5 days/week for 6 weeks <i>Mirror therapy:</i> participants observed the unaffected lower extremity in a mirror while seated to perform movements including hip flexion/extension and internal/external rotation, knee flexion/extension, and ankle plantar/dorsiflexion and circumduction. <i>Sham mirror therapy:</i> participants followed the same treatment regime, with exclusion of visual feedback or motor imagery. Both groups also received standard rehabilitation for 2-3 hours/day, 5 days/week.</p>	<p>Locomotion (-) Berg Balance Scale</p>
<p>Xu et al., 2017 PEDro: 7/10 Country: China</p>	<p>69 patients with subacute stroke</p>	<p>Lower extremity mirror therapy (n=23) Vs. Mirror therapy + neuromuscular electrical stimulation (NMES) (n=23) Vs. Sham mirror therapy (n=23) <u>Treatment details:</u> 30 minutes/session, 5 days/week for 4 weeks <i>Mirror therapy:</i> participants watched movements of the non-paretic limb in a mirror while performing flexion/extension of the non-paretic leg. <i>Mirror therapy + NMES:</i> participants followed the mirror therapy protocol with electrodes on the common peroneal nerve and the midpoint of the anterior tibialis muscle of the affected leg; frequency was 50Hz and intensity was 10mA; duration of simulation and rest were 5 seconds.</p>	<p>At post-treatment (4 weeks): <i>Mirror therapy vs. Sham mirror therapy:</i> (+) 10 Meter Walk Test (10MWT) (+) Brunnstrom stages of motor recovery – Lower extremity (-) Modified Ashworth Scale – plantar flexors (+) Range of motion (ROM) – passive ankle dorsiflexion <i>Mirror therapy + NMES vs. Mirror therapy:</i> (+) 10MWT* (-) Brunnstrom stages of motor recovery – Lower extremity (-) Modified Ashworth Scale – plantar flexors (-) ROM – passive ankle dorsiflexion In favour of Mirror therapy + NMES vs. Mirror therapy</p>

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		<p><i>Sham mirror therapy</i>: participants followed the same treatment regime, with the non-reflective side of the mirror facing the non-paretic leg.</p>	<p><i>Mirror therapy + NMES vs. Sham mirror therapy</i>: (+) 10MWT (+) Brunnstrom stages of motor recovery – Lower extremity (+) Modified Ashworth Scale – plantar flexors (+) ROM – passive ankle dorsiflexion</p>