National Institute for Health and Care Excellence

Final

Stroke rehabilitation in adults (update)

[Q] Evidence reviews for the clinical and cost-effectiveness of mirror therapy

NICE guideline NG236

Evidence reviews underpinning recommendations 1.13.29 and 1.13.30 and recommendations for research in the NICE guideline

October 2023

Final

These evidence reviews were developed by NICE

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ISBN: 978-1-4731-5466-7

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1.1 Review question

In people after stroke, what is the clinical and cost effectiveness of mirror therapy to improve motor function, visuospatial function, and activities of daily living?

1.1.1 Introduction

Following a stroke the use of selected exercises and participation in activities of daily living activities are widely accepted as the standard interventions to improve strength, motor function, and coordination. Mirror therapy is a more recent innovation, originally introduced to help in the treatment of phantom limb pain, but increasingly used in people after stroke. Mirror therapy creates an illusion of movement in the affected limb when the unaffected upper limb moves with a mirror placed between the two.

Although some rehabilitation sites do offer mirror therapy after stroke alongside other interventions, most commonly to treat the upper extremity, there is currently no national standard for this. This review aims to investigate the evidence for effectiveness and cost-effectiveness of mirror therapy in people after stroke.

1.1.2 Summary of the protocol

Table 1: PICO characteristics of review question

Population	Inclusion: • Adults (age ≥16 years) who have had a first or recurrent stroke (including people who had a stroke caused by a subarachnoid haemorrhage) Exclusion: • Children (age <16 years) People after a transient ischaemic attack

Interventions	• Mirror therapy (using a mirror to create a reflection of the non-paretic upper or lower limb to give visual feedback of normal movement). Can include
	  ○ Conventional mirror therapy
	  ○ 'Mirror like' therapies of video or computer graphic interventions
	
	If studies combined mirror therapy and another intervention they included it if at least 50% of the time was spent focused on mirror therapy.

Comparisons	Including: • Sham therapy/placebo • Usual care • No treatment All of these comparisons are pooled together in the analysis (as in the Thieme 2018[99] Cochrane review)
Outcomes	All outcomes are considered equally important for decision making and therefore have all been rated as critical: At time period: • End of the intervention

	• >6 months (if a study reports outcomes after the end of intervention but at ≤6 months then it will not be included in this category)
	
	• Person/participant generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
	• Carer generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
	• Upper limb and hand motor function (continuous outcomes will be prioritised)
	• Lower limb motor function (continuous outcomes will be prioritised)
	• Global motor function (continuous outcomes will be prioritised)
	• Fugl-Meyer Assessment Upper Extremity (continuous outcomes will be prioritised)
	• Measures of motor impairment (continuous outcomes will be prioritised)
	  ○ Upper limb
	  ○ Lower limb
	• Activities of daily living (continuous outcomes will be prioritised)
	• Pain (continuous outcomes will be prioritised)
	• Visuospatial neglect (continuous outcomes will be prioritised)
	• Stroke-specific Patient-Reported Outcome Measures (continuous outcomes will be prioritised)
	• Adverse events (dichotomous outcome)
	• Dropout rate (dichotomous outcome)

Study design	• Systematic reviews of RCTs • Parallel RCTs • Crossover RCTs – only the first period of any crossover RCT will be included (to match parallel trials) If insufficient RCT evidence is available, non-randomised studies will be considered, including: 1. Prospective and retrospective cohort studies 2. Case control trials (if there are no cohort studies)

For full details see the review protocol in Appendix A.

1.1.3 Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in Appendix A and the methods document.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

1.1.4 Effectiveness evidence

1.1.4.1 Included studies

One systematic review[99] and in total one hundred and eight randomised controlled trial studies were included in the review;[1-78, 80-98, 100-110] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary below (Table 3).

This review updated a previous Cochrane review, Thieme 2018[99]. This review included sixty-two studies in a qualitative synthesis and fifty-one studies in a quantitative synthesis[1-4, 7, 8, 10, 11, 15-17, 21, 23, 24, 26, 29, 31, 34, 37, 43-46, 49, 51, 54, 55, 58-60, 62, 63, 66, 67, 70, 72, 75-78, 81-87, 89, 91-94, 96-98, 100, 103, 104, 106-109], all of these studies were included in this review. A search from August 2017 was completed and an additional thirty-six studies were added to the review[5, 9, 12-14, 18-20, 22, 27, 28, 30, 33, 35, 36, 38, 41, 42, 47, 48, 52, 53, 56, 57, 61, 64, 65, 69, 71, 73, 74, 80, 90, 95, 101, 102, 105]. This included ninety-five randomised controlled trials and four cross-over trials[3, 77, 91, 97] (of which only the first phase was included in the analysis). These studies included comparisons of mirror therapy to sham therapy, usual care and no treatment. The three comparisons have been pooled for the analysis as in Thieme 2018[99].

Mirror therapy was either offered with exercises or as a combination with other therapies (including neuromuscular electrical stimulation, transcranial magnetic stimulation, extracorporeal shock wave therapy and motor imagery). These studies were included as in Thieme 2018[99]. The studies represented a mixture of different time periods after stroke, including people in the acute/subacute phases and chronic phase. In most studies, severity and the type of stroke (using the Bamford scale) were not reported.

The majority of therapies were supervised. They included a mixture of upper extremity and lower extremity therapy. One study investigated the use of mirror therapy for facial paresis.

Indirectness

No outcomes were downgraded for indirectness. However, some studies included indirect evidence. This included:

- Comparison indirectness
  - Due to comparing electrical therapy and mirror therapy to sham therapy of both interventions (not just sham mirror therapy)[61]
- Outcome indirectness
  - Due to short follow up duration[11]

Inconsistency

The majority of outcomes showed significant heterogeneity. This was not resolved by subgroup analysis and so random effects models were used and the outcomes were downgraded for inconsistency.

See also the study selection flow chart in Appendix C, study evidence tables in Appendix D, forest plots in Appendix E and GRADE tables in Appendix F.

1.1.4.2 Excluded studies

See the excluded studies list in Appendix J.

1.1.5 Summary of studies included in the effectiveness evidence

Table 2: Summary of studies included in the evidence review

Study	Intervention and comparison	Population	Outcomes	Comments
Acerra 2007[1]	**Mirror therapy** (n=20) Participants were instructed to move both arms while looking in the mirror box, sensory stimulation. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=20) Participants performed the same treatment protocol as in group 1 but only viewing the unaffected arm. **Concomitant therapy** Treatment 5 days a week, 20 to 30 minutes for 2 weeks with an additional usual rehabilitation programme.	**Acute/subacute stroke** Mean age: 68 years N = 40 Type of stroke: Ischaemic = 40 Time period since stroke: 5.3 days Severity: Not stated/unclear.	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention Pain at end of intervention Dropout rate at end of intervention	Setting: Inpatient care in Australia. Funding: Not stated.
Alibakhshi 2016[2]	**Mirror therapy** (n=12) Bilateral upper limb mirror therapy. 3 weeks, 5 days a week, 30 minutes a day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=12) Bilateral arm training without	**Chronic stroke** Mean age: 50.9 years N = 24 Type of stroke: Not stated/unclear. Time period since stroke: No additional information. Severity: Not stated/unclear.	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: Inpatient hospital in Iran. Funding: Neuromuscular Rehabilitation Research Centre - Semnan University of Medical Sciences.

Study	Intervention and comparison	Population	Outcomes	Comments
	mirror. 3 weeks, 5 days a week, 30 minutes a day. **Concomitant therapy** No additional information			
Altschuler 1999[3]	**Mirror therapy** (n=4) 4 weeks of mirror therapy: people were instructed to move the non-paretic arm while looking in the mirror and moving the paretic arm as best as they could; followed by 4 weeks of control therapy, using transparent plastic instead of a mirror (only the first phase of the trial was analysed). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=5) 4 weeks of control therapy where people were instructed to move the non-paretic arm while looking into transparent plastic and moving the paretic arm as best as they could; followed by 4 weeks of mirror therapy (only the first phase of the trial was analysed). **Concomitant therapy**	**Chronic stroke** Mean age: 58.2 years N = 9 Type of stroke: Cerebrovascular accident = 7 Arteriovenous malformation = 2 Time period since stroke: No additional information. Severity: Mild = 1, Moderate = 1, Moderate-Severe = 1, Severe = 4, Extremely severe = 2.	Dropout rate at end of intervention	Setting: United States of America. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	No additional information.			
Amasyali 2016[4]	**Mirror therapy** (n=9) Unaffected wrist, hand flexion, extension and forearm circumduction, and supination–pronation movements, participants practised at home after supervised sessions for an additional 30 minutes a day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care (n=15)** Two groups: One received EMG-triggered electrical muscle stimulation of wrist and finger extensor muscles (pulse duration 200 gs, frequency 50 Hz, 1 sec ramp up, 5 sec biphasic stimulation, 1 sec ramp down; intensity was determined for each participant) for an additional 30 minutes a day. The second group received no additional treatment. **Concomitant therapy** Conventional physiotherapy programme 3 weeks, 5 days a week, 2 hours a day.	**Mixed stroke** Mean age (SD): 58.8 (11.9) years N = 24 Type of stroke: Cortical = 10 Subcortical = 12 Corticosubcortical = 2 Time period since stroke: 5.3 (2.3) months Severity: Not stated/unclear.	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Turkey. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
Antoniotti 2019[5]	**Mirror therapy** (n=20) One-on-one sessions (one therapist treated one patient), lasting 30 minutes each and administered once daily, five days per week for 30 days. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=20) The mirror was flipped so the opaque surface faced the sound arm. Otherwise same care. **Concomitant therapy** In addition to the intervention or control treatment, all patients participated in a conventional rehabilitation programme consisting of physio therapy (45 minutes per session, twice daily, five days per week) and occupational therapy (45 minutes per session, once a day, two to five days per week according to the physician prescription)	**Acute/subacute stroke** Mean age (SD): 68.9 (14.3) years N = 40 Type of stroke: Not stated/unclear Time period since stroke: 25.1 (10.2) days Severity: Not stated/unclear.	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Rehabilitation unit in Italy. Funding: The author(s) received no financial support for the research, authorship and/or publication of this article.
Arya 2019[8]	**Mirror therapy** (n=19) Activity-based mirror therapy	**Chronic stroke** Mean age (SD): 46.4 (7.6) years	Measures of motor impairment at end of intervention	Setting: The occupational therapy department of a

Study	Intervention and comparison	Population	Outcomes	Comments
	including movements such as ball-rolling, rocket-board and pedalling, and conventional mirror therapy for 30 sessions of 1 hour each (3-4/week) provided for 3 months. Conventional motor therapy for 30 minutes of each session. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) Conventional motor therapy for 1 hour of each session, 30 sessions provided over 3 months. **Concomitant therapy** No additional information.	N = 36 Type of stroke: Ischaemic = 27 Haemorrhagic = 9 Time period since stroke (SD): 15.9 (9.1) years Severity: Not stated/unclear.	Dropout rate at end of intervention	rehabilitation institute at India. Funding: Financially supported by Pandit Deendayal Upadhayaya National Institute for Persons with Physical Disabilities, 4 VD Marg, New Delhi-110002, India [107/SC/PDUIPH]. In Forest plots this study will be referred to as Arya 2019A.
Arya 2015[7]	**Mirror therapy** (n=17) Mirror therapy: participants observed mirror image of task-specific movements of the less affected upper limb, each task 20 to 100 times in an increment of 5 to 10 a session. 8 weeks, 5 days a week, 45 minutes MT, additional 45 minutes usual occupational therapy Level of supervision: Supervised	**Chronic stroke** Mean age (SD): 45.5 (13.5) years N = 36 Type of stroke: Ischaemic = 17 Haemorrhagic = 16 Time period since stroke (SD): 12.6 (7.0) months Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Inpatient hospital in India. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Upper extremity **Usual care** (n=16) Usual occupational therapy using principles of Brunnstrom and Bobath approaches 8 weeks, 5 days a week, 90 minutes usual occupational therapy. **Concomitant therapy** No additional information			
Arya 2018[9]	**Mirror therapy** (n=17) Mirror therapy 30 sessions, 40 minutes each across the 6 weeks (5/week). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=14) **Concomitant therapy** 50 minutes of conventional occupational therapy was provided.	**Chronic stroke** Mean age (SD): 45.9 (9.3) years N = 31 Type of stroke: Ischaemic = 14 Haemorrhagic = 17 Time period since stroke (SD): 15.1 (11.9) months Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: National-level rehabilitation institute in an urban city in India. Funding: Indian Council of Medical Research, 5/4-5/2/ADR/2014-NCD-I, New Delhi, India.
Armat 2022[6]	**Mirror therapy** (n=21) Mirror therapy during balance exercises for 30 minutes, 5 days a week for 4 weeks. Level of supervision: Supervised	**Acute/subacute stroke** Mean age (SD): 67.9 (9.2) years N = 40 Type of stroke: Not stated/unclear Time period after stroke: Not stated/unclear	Lower limb motor function at the end of intervention	Setting: Inpatients in Iran. Funding: None.

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Lower extremity **Sham therapy** (n=19) Same exercises with a nonreflective plate. **Concomitant therapy** No additional information	Severity: Not stated/unclear		
Bae 2012[10]	**Mirror therapy** (n=10) Participants observed their unaffected upper limb in mirror while performing movements of both arms, 5 exercises for 6 minutes, 5 times a session. 4 weeks, 5 days a week, 30 minutes. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=10) Participants performed the same treatment protocol as in group 1 but only for the paretic arm. 4 weeks, 5 days a week, 30 minutes. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 53.9 (10.0) years N = 20 Type of stroke: Haemorrhagic = 11 Ischaemic = 9 Time period since stroke (SD): 4.6 (1.1) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.
Bahrami 2013[11]	**Mirror therapy** (n=25) Participants observed movements of	**Mixed stroke** Mean age: Not stated/unclear N = 50	Dropout rate at end of intervention	Setting: Iran. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	healthy upper and lower extremities in front of the mirror (20 sessions, 3 to 5 days a week, additional 30 minutes mirror therapy). Level of supervision: Supervised Limb therapy is used for: Both **Usual care** (n=25) **Concomitant therapy** Physiotherapy and neuromuscular stimulation 20 sessions, 3 to 5 days a week, 30 minutes.	Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear		
Bai 2019[12]	**Mirror therapy** (n=23) Two groups: One received movement-based mirror therapy (n=12) while the other received task-based mirror therapy (n=11). 5 days/week, for a total of 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=11) Multi-disciplinary rehabilitation training, including customary physiotherapy and occupational therapy. 5 days/week, for a total of 4 weeks.	**Acute/subacute stroke** Mean age (SD): 56.2 (13.7) years N = 34 Type of stroke: Ischaemic = 25 Time period since stroke (SD): 71.5 (49.7) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Activities of daily living at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Rehabilitation hospital in China. Funding: This work was supported by the Fundamental Research Funds for the Central Universities (No. 22120180401) and Research Project of Shanghai Disabled Person' Federation (2016).

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy No additional information			
Bhoraniya 2018[13]	**Mirror therapy** (n=13) Mirror therapy and conventional therapy. 15 minutes of mirror therapy and 30 minutes of conventional therapy using a custom made program 5 times a week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=13) Conventional therapy for 45 minutes a session 5 times a week for 4 weeks. **Concomitant therapy** No additional information.	**Chronic stroke** Mean age: 61.0 years N = 23 Type of stroke: Ischaemic = 16 Haemorrhagic = 10 Time period since stroke: 30.5 months Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: Outpatient follow up in India. Funding: No additional information.
Broderick 2019[14]	**Mirror therapy** (n=15) Mirror therapy and treadmill training group 30 minutes a day, 3 days per week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Sham therapy** (n=15) Treadmill training with mirror facing a direction where	**Chronic stroke** Mean age (SD): 64.1 (15.6) years N = 30 Type of stroke: Ischaemic = 18 Haemorrhagic = 12 Time period since stroke (SD): 54.7 (69.0) months Severity: Not stated/unclear.	Measures of motor impairment at end of intervention	Setting: Outpatient follow up in Ireland. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	they couldn't see the other leg 30 minutes a day, 3 days per week for 4 weeks. **Concomitant therapy** No additional information			
Cacchio 2009[15]	**Mirror therapy** (n=24) Participants performed upper extremity movements while looking in the mirror, without additional verbal feedback. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=24) Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 58.4 (9.7) years N = 48 Type of stroke: Ischaemic = 35 Haemorrhagic = 13 Time period since stroke (SD): 5.0 (2.7) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention and 6 months Pain at end of intervention and 6 months Dropout rate at end of intervention	Setting: Inpatient and outpatient rehabilitation centre in Italy. Funding: Not stated. In Forest plots this study will be referred to as Cacchio 2009A.

Study	Intervention and comparison	Population	Outcomes	Comments
Cacchio 2009[16]	**Mirror therapy** (n=8) Participants performed cardinal upper extremity movements while looking in the mirror. 5 days a week; 30 minutes of therapy for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy and usual care** (n=16) Two groups: Sham therapy (n=8) Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. Usual care (n=8) Participants performed mental imagery. 5 days a week; 30 minutes of therapy for 4 weeks. **Concomitant therapy** No additional information.	**Chronic stroke** Mean age: 62 years N = 24 Type of stroke: Ischaemic = 19 Haemorrhagic = 5 Time period since stroke: 15.7 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Pain at end of intervention Dropout rate at end of intervention	Setting: Inpatient and outpatient rehabilitation centre in Italy. Funding: Not stated. In Forest plots this study will be referred to as Cacchio 2009B.
Cha 2015[17]	**Mirror therapy** (n=19) Mirror therapy and repetitive transcranial magnetic stimulation (rTMS). 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes mirror therapy).	**Chronic stroke** Mean age (SD): 58.8 (8.7) years N = 36 Type of stroke: Not stated/unclear Time period since stroke (SD): 1.8 (0.8) months Severity: Not stated/unclear	Lower limb motor function at end of intervention	Setting: Republic of Korea. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Lower extremity **Sham therapy** (n=17) Sham therapy and repetitive transcranial magnetic stimulation (rTMS). Same therapy protocol, except the mirror was covered. 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes sham therapy). **Concomitant therapy** No additional information			
Chan 2018[18]	**Mirror therapy** (n=20) Five structured exercises performed with both the paretic and intact arm with a mirror. Sessions lasted 30 minutes twice a day, 5 days a week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=21) The same five structured exercises with both the paretic and intact arm but without a mirror.	**Acute/subacute stroke** Mean age (SD): 64.6 (12.6) years N = 41 Type of stroke: Ischaemic = 27 Haemorrhagic = 8 Time period since stroke (SD): 13.2 (6.7) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rates at end of intervention	Setting: Stroke rehabilitation unit in China. Funding: Financial disclosure statements have been obtained, and no conflicts of interest have been reported by the authors or by any individuals in control of the content of this article.

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy Conventional rehabilitation in the hospital attended by all subjects, the regime included 1.5 hrs physiotherapy, 1-hr occupational therapy daily during the weekdays, and speech therapy/clinical psychology sessions when applicable			
Chaudhari 2019[19]	**Mirror therapy** (n=25) Mirror therapy plus conventional therapy for 3 days per week for 4 weeks. Level of supervision: Not stated/unclear Limb therapy is used for: Upper extremity **Usual care** (n=25) Conventional therapy for 3 days per week for 4 weeks. **Concomitant therapy** No additional information	**Stroke (unclear time period since stroke)** Mean age: Not stated/unclear N = 50 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Measures of motor impairment at end of intervention	Setting: Stroke rehabilitation centre in India. Funding: Self funded. This study was a quasi-experimental pre test post test design. However, it states that patients were randomly assigned to their treatment groups so we have included but marked down for risk of bias.
Chinnavan 2020[20]	**Mirror therapy** (n=13) First 30 minutes therapy consists of conventional therapy as given conventional tasks only with the affected upper extremity. 15 minutes were continued with mirror therapy which tasks only with the unaffected	**Chronic stroke** Age: 45 to 65 years N = 25 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention	Setting: Private hospitals and physiotherapy centres in Malaysia. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	upper extremity. 3 days / week. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=12) 45 minutes of consecutive session and therapy consisted of performing tasks only with the affected upper extremity for 3 days / week. **Concomitant therapy** No additional information			
Cho 2015[21]	**Mirror therapy** (n=14) Participants performed movements of both upper limbs, 10 sets, 20 repetitions of each motion, 2-minute rest between sets. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=13) Participants performed the same exercises	**Chronic stroke** Mean age (SD): 59.3 (10.5) years N = 27 Type of stroke: Infarction = 17 Haemorrhage = 10 Time period since stroke (SD): 14.3 (6.6) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention	Setting: Republic of Korea. Funding: Wonkwang Health Science University.

Study	Intervention and comparison	Population	Outcomes	Comments
	with non-reflective surface between limbs. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes sham therapy. **Concomitant therapy** No additional information			
Choi 2019[22]	**Mirror therapy** (n=24) Two groups. Conventional mirror therapy (n=12) and gesture recognition mirror therapy (n=12). Training program consisting of 15 sessions, 30 min per day, 3 days per week, for 5 weeks Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=12) Same training program consisting of 15 sessions, 30 min per day, 3 days per week, for 5 weeks but without being able to see the mirror. **Concomitant therapy** No additional information	**Chronic stroke** Mean age (SD): 59.0 (13.6) years N = 36 Type of stroke: Not stated/unclear Time period since stroke (SD): Not stated/unclear Severity: Not stated/unclear	Person/patient health-related quality of life at end of intervention Upper limb and hand motor function at end of intervention	Setting: A rehabilitation centre in the Republic of Korea. Funding: Not stated.
Colomer 2016[23]	**Mirror therapy** (n=17) Participants observed their unaffected upper limb in mirror while	**Chronic stroke** Mean age (SD): 53.6 (8.3) years N = 33	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment	Setting: An outpatient rehabilitation centre in Spain. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	performing movements with less affected upper limb: flexion-extension of shoulder, pronation and supination of forearm, fine and gross motor tasks with and without objects (balls, cups) and usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=16) Usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of passive mobilisation. **Concomitant therapy** No additional information	Type of stroke: Ischaemic = 23 Haemorrhagic = 8 Time period since stroke (SD): 553.1 (390.5) days Severity: Not stated/unclear	Upper Extremity at end of intervention Dropout rate at end of intervention	
Cristina 2015[24]	**Mirror therapy** (n=7) Mirror therapy - bilateral (as good as possible) upper limb movements (flexion and extension of the shoulder, elbow, wrist and finger, pronation and supination of the forearm) under physiotherapeutic supervision. 30 minutes of mirror	**Acute/subacute stroke** Mean age (SD): 57.5 (7.8) years N = 15 Type of stroke: Not stated/unclear Time period since stroke (SD): 53.2 (10.8) days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: Inpatient care in Romania. Funding: Not financed.

Study	Intervention and comparison	Population	Outcomes	Comments
	therapy with 6 weeks, 5 times a week, 30 minutes a session conventional stroke rehabilitation programme. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=8) 5 times a week, 30 minutes a session conventional stroke rehabilitation programme. **Concomitant therapy** Conventional stroke rehabilitation programme (neuro-rehabilitation technique, electrical stimulation and occupational therapy).			
Cui 2022[25]	**Mirror therapy** (n=16) Mirror therapy 5 times a week for 30 minutes over 3 weeks in addition to usual care. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=16) **Concomitant therapy** Both groups received medication and routine	**Acute/subacute stroke** Mean age (SD): 60 (10.7) years N = 32 Type of stroke: Not stated/unclear Time period since stroke (SD): 20.7 (4.9) days Severity: Not stated/unclear	Lower limb motor function at the end of intervention Measures of motor impairment at the end of intervention Activities of daily living at the end of intervention Dropout rate at the end of intervention	Setting: Outpatient follow up in China. Funding: Supported by Sichuan Province Pharmaceutical Administration (Grant No. 2014B064), the Key R&D Program of Sichuan Province (No.2020YFS0415).

Study	Intervention and comparison	Population	Outcomes	Comments
	rehabilitation therapy. The amount of time of routine rehabilitation therapy provided was not specified.			
Dalla Libera 2015[26]	**Mirror therapy** (n=5) Transcranial magnetic stimulation with mirror therapy. 15 minutes of mirror therapy. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=5) Transcranial magnetic stimulation. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes. **Concomitant therapy** No additional information	**Acute/subacute stroke** Age: Not stated/unclear N = 10 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	No outcomes reported (included in the Cochrane review)	Setting: Switzerland. Funding: Not stated.
De 2017[27]	**Mirror therapy** (n=15) 30 mins plus 30 mins of additional	**Mixed stroke** Age range: 50-65 years	Measures of motor impairment at end of intervention	Setting: India.

Study	Intervention and comparison	Population	Outcomes	Comments
	conventional therapy which included neurodevelopmental facilitation technique, stretching, gait training that is a total of 1 hour per day for 5 days a week for 4 weeks. Both therapies consisted of ankle dorsiflexion and ankle eversion. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=15) mental imagery - 30 mins plus 30 mins of additional conventional therapy which included neurodevelopmental facilitation technique, stretching, gait training that is a total of 1 hour per day for 5 days a week for 4 weeks. Both therapies consisted of ankle dorsiflexion and ankle eversion. **Concomitant therapy** No additional information	N = 30 Type of stroke: Not stated/unclear Time period since stroke: 3-12 months Severity: Not stated/unclear		Funding: The institute has Balance trainer and BMI Analyser in research labs. Except for this it was a self financed study.
Ding 2019[28]	**Mirror therapy** (n=10) Camera technique-based mirror visual feedback with simple motor training and task-specific motor training delivered for 1.5 hours per	**Acute/subacute stroke** Mean age (SD): 58.3 (13.2) years N = 10 Type of stroke: Not stated/unclear	Lower limb motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: Outpatient follow up in China. Funding: This project was supported in part by the National Key R&D Program of China (2018YFC2002300 and

Study	Intervention and comparison	Population	Outcomes	Comments
	day for 5 days per week for 4 weeks in total. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=10) Dosage-equivalent rehabilitation (same intensity and duration). **Concomitant therapy:** All people received 1.5 hours of training per day in addition to their routine rehabilitation in hospital, 5 days per week for 4 weeks.	Mean time period after stroke (SD): 72.5 (36.8) days Severity: Not stated/unclear	Activities of daily living at end of intervention Dropout rate at end of intervention	2018YFC2002301) and the National Natural Science Foundation of China (No. 61771313).
Dohle 2009[29]	**Mirror therapy** (n=24) Participants were instructed to move both arms "as well as possible" while looking in the mirror. 5 days a week; 30 minutes of therapy for 6 weeks Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=24) Bilateral arm training: participants performed the same treatment protocol as in group 1 but without a mirror	**Acute/subacute stroke** Mean age: 56.5 years N = 48 Type of stroke: Ischaemic = 48 Time period since stroke: 27 days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Pain at end of intervention Visuospatial neglect at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Germany. Funding: Rehabilitation research network (refonet) of the German Pension Scheme Rhineland.

Study	Intervention and comparison	Population	Outcomes	Comments
	5 days a week; 30 minutes of therapy for 6 weeks **Concomitant therapy** No additional information			
Ehrensberger 2019[30]	**Mirror therapy** (n=18) Mirror therapy and strength training three times a week for 4 weeks (12 sessions) under constant supervision of two exercise therapists Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) Strength training only three times a week for 4 weeks **Concomitant therapy** No additional information	**Chronic stroke** Mean age (SD): 62.4 (13.5) years N = 15 Type of stroke: Ischaemic = 21 Haemorrhagic = 11 Time period since stroke (SD): 82.9 (79.7) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Activities of daily living at end of intervention Stroke-specific Patient-Reported Outcome Measures at end of intervention Dropout rate at end of intervention	Setting: Home-based in Ireland. Funding: ME was supported by the Institute of Technology Sligo President's Bursary Fund and Irish Research Council Postgraduate Scholarship (GOIPG/2016/1662). DS was supported by Institutes of Technology Ireland Postgraduate Research Scholarship and Institute of Technology Sligo Capacity Building Fund.
Geller 2016[31]	**Mirror therapy** (n= 4) Two groups: bimanual mirror therapy as home programme and unimanual mirror therapy as home programme -6 weeks, 5 days a week, 30-minute home programme Level of supervision: Not stated/unclear Limb therapy is used for: Upper extremity	**Stroke** Age range: 34-73 years N = 6 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	No outcomes reported (included in the Cochrane review)	Setting: Outpatient (home-based) in the United States of America. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual care (n=2) 6 weeks, 5 days a week, 30-minute home programme of traditional OT **Concomitant therapy** 6 weeks, 2 times a week OT in the clinic for all groups			
Geller 2022[32]	**Mirror therapy** (n=17) Two groups combined for this analysis. Group 1 (n=10) received unilateral mirror therapy. Group 2 (n=7) received bilateral mirror therapy). Both received therapy for 30 minutes a day, 5 days a week for 6 weeks. Level of supervision: Unsupervised Limb therapy is used for: Upper extremity **Usual care** (n=8) Same tasks as the mirror therapy group but without a mirror. **Concomitant therapy** All people received two 45 minute standard occupational therapy sessions in clinic and one weekly 30 minute session with the primary research occupational therapist.	**Chronic stroke** Mean age (SD): 60 (15.0) years N = 25 Type of stroke: Not stated/unclear Time period since stroke (SD): 29.5 (59.9) months Severity: Not stated/unclear	Upper limb and hand motor function at the end of intervention Fugl-Meyer Assessment Upper Extremity at the end of intervention Measures of motor impairment at the end of intervention Stroke-specific Patient-Reported Outcome Measures at the end of intervention Dropout rate at the end of intervention	Setting: Outpatients in the United States of America. Funding: Not stated/unclear.
Guo 2019[33]	**Mirror therapy** (n=60)	**Chronic stroke** Mean age (SD): 68.1 (11.1) years	Fugl-Meyer Assessment Upper Extremity	Setting: Hospital inpatients in China.

Study	Intervention and comparison	Population	Outcomes	Comments
	Two groups: Mirror therapy + conventional rehab MT was for 20 min per day, five times a week, for 4 weeks. Mirror therapy + extracorporeal shock wave therapy – Was given for 20 min per day, five times a week, for 4 weeks. In addition patients received conventional rehabilitation therapy for 30 min per day, five times a week, for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=60) Two groups: Extracorporeal shock wave therapy and conventional rehabilitation, or conventional rehabilitation only. **Concomitant therapy** The conventional program was provided to all and consisted of exercise therapy, occupational therapy, and neurodevelopmental facilitation techniques for 30 min per day, five times a week, for 4 weeks.	N = 120 Type of stroke: Ischaemic = 54 Time period since stroke (SD): 3.3 (0.9) months Severity: Not stated/unclear	at end of intervention and 6 months Adverse events at end of intervention and 6 months	Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
Gurbuz 2016[34]	**Mirror therapy** (n=16) 4 weeks, 5 times a week, 60 to 120 minutes upper extremity rehabilitation programme + additional mirror therapy: activities of the affected limb; flexion and extension of the wrist and finger - 4 weeks, 5 times a week, 20 minutes MT Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=15) 4 weeks, 5 times a week, 60 to 120 minutes upper extremity rehabilitation programme + Additional sham therapy: same therapy protocol with a covered mirror (activities of the affected limb; flexion and extension of the wrist and finger). 4 weeks, 5 times a week, 20 minutes sham therapy **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age: 60.9 years N = 31 Type of stroke: Ischaemic = 25 Time period since stroke: 43.3 days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention	Setting: Inpatient rehabilitation centre in Turkey. Funding: Not stated.
Hassan 2015[35]	**Mirror therapy** (n=15) An additional 30 min of mirror therapy training.	**Chronic stroke** Mean age (SD): 59.6 (9.1) years N = 30 Type of stroke:	Measures of motor impairment at end of intervention	Setting: China. Funding: Not stated/unclear.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=15) The same exercises for the same duration but used the non-reflecting side of the mirror **Concomitant therapy** A conventional stroke rehabilitation program 5 days a week, 2 to 5 hours a day, for 4 weeks	Ischaemic = 21 Time period since stroke (SD): 15.2 (1.6) months Severity: Not stated/unclear		
Hatwar 2019[36]	**Mirror therapy** (n=19) Patients were given 15 minutes of mirror therapy,15 minutes of motor imagery and 30 minutes of conventional rehabilitation. The interventions were given for 2 weeks (5 days a week). Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=19) Patients were given given 15 minutes of motor imagery and 45 minutes of conventional treatment. The interventions were given for 2 weeks (5 days a week). **Concomitant therapy**	**Acute/subacute stroke** Mean age (SD): 55.2 (8.9) years N = 38 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: A rehabilitation unit in India. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Conventional treatment was given according to patient's requirements which included stretching, active and passive range of motion exercises, weight bearing, balance and coordination exercise.			
Hiragami 2013[37]	**Mirror therapy** (n=7) Mirror therapy. 4 weeks, 6 - 7 days a week, daily 2 hours with an additional 30 minutes mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=7) **Concomitant therapy** Conventional stroke rehabilitation programme (physiotherapy, occupational therapy).	**Acute/subacute stroke** Mean age (SD): 67.5 years N = 14 Type of stroke: Ischaemic = 9 Haemorrhagic = 5 Time period since stroke: 47 days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Inpatient hospital in Japan. Funding: Not stated.
Hsieh 2020[38]	**Mirror therapy** (n=7) Each participant received intervention for 15 training sessions (60 minutes/day, 5 days/week for 3 weeks). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=7)	**Acute/subacute stroke** Mean age (SD): 50.4 (14.1) years N = 14 Type of stroke: Ischaemic = 5 Time period since stroke: 3.7 (2.1) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Stroke-specific Patient-Reported Outcome Measures at end of intervention	Setting: Rehabilitation centre in Taiwan. Funding: This study was supported by the Ministry of Science and Technology (MOST 105-2314-B-182-018 and MOST 106-2314-B-182-015-MY3) and partly supported by the Healthy Aging Research Center, Chang Gung University, from the Featured Areas

Study	Intervention and comparison	Population	Outcomes	Comments
	Customary Bilateral Arm Training for the same time. **Concomitant therapy** No additional information		Adverse events at end of intervention	Research Center Program within the Framework of the Higher Education Sprout Project by the Ministry of Education (EMRPD1I0451) in Taiwan and the Chang Gung Memorial Hospital (BMRPD25) in Taiwan.
Hsu 2022[39]	**Mirror therapy** (n=35) Virtual reality mirror therapy or traditional mirror therapy for 30 minutes, twice a week for 9 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) 30 minutes of conventional occupational therapy for the same time period. **Concomitant therapy** Everyone received 20 minute sessions of task-specific training.	**Chronic stroke** Mean age (SD): 55.4 (12.3) years N = 52 Type of stroke: Not stated/unclear Time period since stroke (SD): 36.1 (25.9) months Severity: Not stated/unclear	Upper limb and hand motor function at the end of intervention Fugl-Meyer Assessment Upper Extremity at the end of intervention Dropout rate at the end of intervention Adverse events at the end of intervention	Setting: Outpatients in Taiwan. Funding: Supported by the ministry of science and technology (MOST), Taiwan. [Grant number: 106-2314-B-006-049-MY2].
Hung 2022[40]	**Mirror therapy** (n=12) 45 minutes of mirror therapy and 30 minutes of functional training, 3 times weekly for 8 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity	**Chronic stroke** Mean age (SD): 47.3 (11.5) years N = 37 Type of stroke: Not stated/unclear Time period since stroke (SD): 34.84 21.98 months Severity: Not stated/unclear	Upper limb and hand motor function at the end of intervention Fugl-Meyer Assessment Upper Extremity at the end of intervention Dropout rate at the end of intervention	Setting: Outpatients in Taiwan. Funding: Government/academic grant funding.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual care (n=12) 45 minutes of conventional task-oriented exercise and 30 minutes of functional training, 3 times weekly for 8 weeks. A third arm (n=13) was reported but not included in the analysis as they received an additional intervention that was not relevant to this protocol. **Concomitant therapy** All people received an injection of botulinum toxin type A. All other routine rehabilitation that did not involve upper extremity training continued as usual.			
Hyun-Gyu 2016[41]	**Mirror therapy** (n=13) Mirror therapy with a task-oriented exercise program for 30 minutes, twice a day, five times a week for a period of 4 weeks. The mirror was 5 x 3m in the therapy room. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=12) Task-oriented exercise program only.	**Chronic stroke** Mean age (SD): 59.3 (3.7) years N = 25 Type of stroke: Infarction = 5 Haemorrhage = 15 Time period since stroke (SD): 15.6 (2.5) months Severity: Not stated/unclear	Lower limb motor function at end of intervention Dropout rate at end of intervention	Setting: Outpatient follow up in the Republic of Korea. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy No additional information			
Ikizler May 2020[42]	**Mirror therapy** (n=21) 30 minutes of mirror therapy per session in addition to usual care. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=21) Conventional rehabilitation program for four weeks consisting of 60 to 120 minutes/day for five days a week. Included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist. **Concomitant therapy** No additional information	**Mixed stroke** Mean age (SD): 58.0 (8.8) years N = 42 Type of stroke: Thromboembolic = 35 Haemorrhagic = 7 Time period since stroke (median [range]): 45 (15-365) days Severity: Not stated/unclear	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Outpatient follow up in Turkey. Funding: No financial support was received for the research and/or authorship of the article.
In 2012[44]	**Mirror therapy** (n=14) Virtual mirror therapy: affected arm lay in a box with a monitor positioned on the box, the unaffected arm was positioned	**Chronic stroke** Mean age (SD): 63.9 (12.2) years N = 24 Type of stroke: Haemorrhagic = 9 Ischaemic = 10	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	under a camera, looking on the screen while performing movements of both arms, supervision of caregivers. 4 weeks, 5 days a week, 30 minutes additional virtual reality (VR) reflection therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=10) Additional sham therapy (same treatment, but the monitor was off). 4 weeks, 5 days a week, 30 minutes of additional sham therapy. **Concomitant therapy** Conventional stroke rehabilitation programme	Time period since stroke (SD): 13.5 (5.8) months Severity: Not stated/unclear	Dropout rate at end of intervention	
In 2016[43]	**Mirror therapy** (n=15) 4 weeks, 5 days a week, 30 minutes virtual reality (VR) reflection therapy/mirror therapy Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=15) 4 weeks, 5 days a week, 30 minutes virtual reality (VR)	**Chronic stroke** Mean age: 59.5 years N = 30 Type of stroke: Ischaemic = 16 Time period since stroke: 13.1 days Severity: Not stated	Lower limb motor function at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	reflection sham therapy (same treatment as intervention group but the monitor was off), supervision of caregivers. **Concomitant therapy** 4 weeks, 5 days a week, 30 minutes conventional stroke rehabilitation programme			
Invernizzi 2013[45]	**Mirror therapy** (n=13) Participants observed their unaffected upper limb in mirror while performing movements of the unaffected limb, self-selected speed, no additional verbal feedback. 5 days a week, 30 minutes of MT for 1st 2 weeks, 60 minutes of MT for the last 2 weeks Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=13) Participants performed the same treatment protocol with a covered mirror 5 days a week, 30 minutes for 1st 2 weeks and 60 minutes of sham therapy for the last 2 weeks **Concomitant therapy**	**Acute/subacute stroke** Mean age: 66.6 years N = 23 Type of stroke: Ischaemic = 26 Time period since stroke: 23 days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Adverse events at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Italy. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual rehabilitation programme 1 hour, 5 times a week			
Ji 2014[46]	**Mirror therapy** (n=23) Two groups. Mirror therapy with repetitive transcranial magnetic stimulation 15 minutes a day. Mirror therapy for 15 minutes a day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=12) Sham therapy using a covered mirror: same movements as in Mirror therapy. 15 mins a day. **Concomitant therapy** All subjects were conducted with traditional physical therapy for 30 minutes a day, 5 times a week, for 6 weeks. Traditional physical therapy consisted of neurodevelopment treatment.	**Chronic stroke** Mean age: 52.6 years N = 35 Type of stroke: Ischaemic = 19 Time period since stroke: 8.9 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: A university hospital in the Republic of Korea. Funding: Not stated.
Kang 2017[47]	**Mirror therapy** (n=10) Mirror therapy using a tablet PC while exercising. 15 minutes of orofacial exercise twice daily for 14 days. Level of supervision: Supervised	**Acute/subacute stroke** Mean age (SD): 59.4 (14.0) years N = 20 Type of stroke: Ischaemic = 20 Haemorrhagic = 1	Measures of motor impairment at end of intervention	Setting: A rehabilitation unit in Korea. Funding: No additional information. This study reports measures of motor impairment for the midface and the

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Other (facial) **Usual care** (n=10) Exercises only. **Concomitant therapy** No additional information	Time period since stroke: Not stated/unclear Severity – NIHSS scale (SD): 24.2 (4.5)		mouth separately. Both have been extracted.
Kaviraja 2021[48]	**Mirror therapy** (n=15) Mirror therapy 5 days a week for a duration of 30 minutes. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=15) Modified constrain induced movement therapy 5 days a week for a duration of 30 minutes. **Concomitant therapy** No additional information	**Mixed stroke** Age range: 55-70 years N = 30 Type of stroke: Not stated Time period since stroke (range): 2-12 months Severity: Not stated	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: The Faculty of Physiotherapy (outpatient follow up) in India. Funding: Self funded.
Kawakami 2015[49]	**Mirror therapy** (n=16) Mirror therapy of the ankle. 4 weeks, 1 hour a day standard rehabilitation programme. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=65)	**Acute/subacute stroke** Mean age: 64.1 years N = 81 Type of stroke: Ischaemic = 28 Time period since stroke: 32.3 days Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Japan. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	A mixture of integrated volitional control electrical stimulation, therapeutic electrical stimulation, repetitive facilitating exercises, and training programme of range of motion and activities of daily living exercises. **Concomitant therapy** All groups received 20 minutes of the assigned treatment within conventional physiotherapy			
Kim 2014[51]	**Mirror therapy** (n=14) Additional mirror therapy and functional electrical stimulation for an additional 5 days a week, 30 minutes a day, 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=13) Additional sham therapy and functional electrical stimulation: The same treatment protocol as group 1, while looking on the non-reflecting surface of the mirror for an additional 5 days a week, 30 minutes a day, 4 weeks **Concomitant therapy**	**Acute/subacute stroke** Mean age (SD): 55.8 (12.2) years N = 27 Type of stroke: Middle cerebral artery = 9 Basal ganglia = 5 Midbrain = 2 Frontal lobe = 2 Internal capsule = 1 Corona radiate = 2 Pons = 2 Time period since stroke (SD): 34.5 (10.5) days Severity: Not stated	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: University hospital in the Republic of Korea. Funding: Sahmyook University.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual rehabilitation treatment 60 minutes/day, 5 times/week, 4 weeks usual rehabilitation treatment			
Kim 2015[54]	**Mirror therapy** (n=22) Two groups. MT with biofeedback functional electrical stimulation (BF-FES: EMG). Mirror therapy with functional electrical stimulation. Both 4 weeks, 5 days per week, 30 minutes a session Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=11) **Concomitant therapy** Conventional rehabilitation programme alone - 4 weeks, 5 days a week, 30 minutes a day	**Chronic stroke** Mean age: 57.7 years N=33 Type of stroke: Ischaemic = 14 Time period since stroke: 404.4 days Severity: Not stated	Upper limb and hand motor function at end of intervention Activities of daily living at end of intervention Stroke-specific Patient-Reported Outcome Measures at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.
Kim 2016[55]	**Mirror therapy** (n=12) Mirror therapy: included reaching, grasping, manipulation, towel-folding, table-wiping, sponge-squeezing, peg-board, card-turnover, and typing with the unaffected limb while watching the mirror. 4 weeks, 5 days a week, 30 minutes a day.	**Acute/subacute stroke** Mean age: 49.1 years N = 25 Type of stroke: Ischaemic = 8 Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention	Setting: Outpatient hospital in the Republic of Korea. Funding: Not stated. In Forest plots this study will be named Kim 2016A.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=13) Conventional exercises: arm bicycling, peg-board exercise, skateboard-supported exercises on a table top, donut on base putty kneading, double curved arch, bimanual placing cone, block-stacking, graded pinch exercise, plastic-cone stacking, shoulder curved arch without mirror. 4 weeks, 5 days a week, 30 minutes a day of the control intervention. **Concomitant therapy** No additional information			
Kim 2016[56]	**Mirror therapy** (n=17) Mirror therapy and conventional rehabilitation therapy for a total of 60 minutes (mirror therapy: 30 minutes; conventional rehabilitation therapy: 30 minutes) per day, with a 10 minutes rest period halfway through the session Level of supervision: Limb therapy is used for:	**Acute/subacute stroke** Mean age (SD): 53.5 (8.9) years N = 34 Type of stroke: Ischaemic = 26 Time period since stroke (SD): 4.6 (1.2) months Severity: Not stated	Dropout rate at end of intervention	Setting: Stroke rehabilitation unit in the Republic of Korea. Funding: No financial or material support of any kind was received for the work described in this article. In Forest plots this study will be named Kim 2016B.

Study	Intervention and comparison	Population	Outcomes	Comments
	Sham therapy (n=17) The control group performed the same exercise for the same duration as the experimental group, but the reflective side of the mirror was covered with white fabric. **Concomitant therapy** Conventional rehabilitation therapy consists of neurodevelopmental facilitation techniques.			
Kim 2017[53]	**Mirror therapy** (n=10) Mirror therapy. Comfortably sitting on a chair, people put their paretic arm into the mirror box (24cm x 35cm x 24cm). Physical training for an average of 35.6 (4.17) minutes 20.6 (4.17) times over the treatment time (five days a week for 4 weeks). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=10) Same exercises completed using a mirror box placed so that nothing would be seen on the surface and instructing the people to watch a nature	**Chronic stroke** Mean age (SD): 54.3 (9.3) years N = 20 Type of stroke: Infarction = 13 Haemorrhage = 6 Time period since stroke (SD): 398.7 (188.3) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Republic of Korea. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	documentary video not related to the movements in the program. **Concomitant therapy** No additional information			
Kim 2018[57]	**Mirror therapy** (n=20) Two groups. Mirror therapy with lower extremity exercise, and mirror therapy with lower extremity muscle strength exercise group (same exercises with a sandbag on the ankle). 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n= 10) Exercise only. 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital. **Concomitant therapy:** No additional information	**Chronic stroke** Mean age (SD): 68.0 (11.9) years N = 30 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: No additional information. Funding: This study was supported by a Daegu University Research Grant (2017). In Forest plots this study will be named Kim 2018B.
Kim 2018[52]	**Mirror therapy** (n=12) High frequency repetitive transcranial magnetic stimulation (applied at 20Hz over the hand motor area in	**Acute/subacute stroke** Mean age (SD): 62.6 (11.9) years N = 24 Type of stroke: Ischaemic = 12	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention	Setting: Outpatient follow up in the Republic of Korea. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	the cortex of the affected hemisphere for 15 minutes) combined with task-oriented mirror therapy training. Training was conducted for 30 minutes. Interventions occurred 5 days/week for 2 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=12) High frequency repetitive transcranial magnetic stimulation and general exercise therapy only. Interventions occurred 5 days/week for 2 weeks. **Concomitant therapy** No additional information	Haemorrhagic: 8 Time period since stroke (SD): 1.7 (0.7) months Severity: Not stated/unclear	Dropout rate at end of intervention	In Forest plots this study will be named Kim 2018A.
Kim 2022[50]	**Mirror therapy** (n=28) Two groups, one (n=14) received mirror therapy through a video augmented wearable reflection device, one (n=14) received traditional mirror therapy. Both received this for 30 minutes/day, 5 days a week for 4 weeks in addition to usual care.	**Chronic stroke** Mean age (SD): 59.8 (5.1) years N = 42 Type of stroke: Not stated/unclear Time period since stroke (SD): 6.8 (2.5) months Severity: Not stated/unclear	Upper limb and hand motor function at the end of intervention Fugl-Meyer Assessment Upper Extremity at the end of intervention Dropout rate at the end of intervention	Setting: Outpatients in the Republic of Korea. Funding: Government or Academic grants.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=14) **Concomitant therapy** Conventional rehabilitation including physical and occupational therapy for 60 minutes a day, 5 days a week for 4 weeks.			
Kojima 2014[58]	**Mirror therapy** (n=6) Immediate Electromyography-triggered neuromuscular stimulation-Mirror therapy (ETMS-MT) 4 weeks, 5 days a week, two 20-minute sessions a day (additional therapy for the 1st 4 weeks, then crosses over. Only the first period will be considered in the analysis). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=7) Delayed mirror therapy treatment (starts at 4 weeks. However, only the first phase is analysed for this review).	**Acute/subacute stroke** Mean age (SD): 69.1 (13.4) years N = 13 Type of stroke: Ischaemic = 10 Haemorrhagic = 3 Time period since stroke (SD): 78.8 (38.2) days Severity: No additional information	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Japan. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy Standard physiotherapy and occupational therapy for 8 weeks, 5 days a week, 2 hours a day physiotherapy and occupational therapy.			
Kumar 2013[59]	**Mirror therapy** (n=15) Mirror therapy for the lower extremity, self-selected speed, under supervision twice daily for 15 minutes for 10 days. Level of supervision: Supervision Limb therapy is used for: Lower extremity **Usual care** (n=15) No additional information **Concomitant therapy** Conventional physical therapy 40 - 45 minutes/day for 10 days conventional physical therapy.	**Stroke** Mean age: 57.3 years N = 30 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Measures of motor impairment at end of intervention Dropout rate at end of intervention	Study setting: India. Funding: Not stated.
Kuzgun 2012[60]	**Mirror therapy** (n=10) Mirror therapy involving wrist extension of non-paretic upper extremity for 15 mins, 4 times daily along with conventional rehab programme for 4 weeks, 5 days a week, daily 1 - 2 hours.	**Acute/subacute stroke** Mean age: 61.4 years N = 20 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention	Setting: Turkey. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=10) Conventional rehabilitation programme for 4 weeks, 5 days a week, daily 1 - 2 hours with no additional therapy. **Concomitant therapy** No additional information			
Lee 2016[62]	**Mirror therapy** (n=15) Mirror therapy and neuromuscular electrical stimulation. Additional 4 weeks, 5 days a week of the mirror therapy. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=15) **Concomitant therapy** Conventional physiotherapy 4 weeks, 5 days a week, 1 hour a day.	**Chronic stroke** Mean age: 54.7 years N = 30 Type of stroke: Ischaemic = 8 Time period since stroke: 39.6 months Severity: Not stated/unclear	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: Rehabilitation hospital in the Republic of Korea. Funding: Not stated.
Lee 2012[63]	**Mirror therapy** (n=14) Mirror therapy: participants were instructed to observe their unaffected upper limb in mirror box while performing movements of the	**Acute/subacute stroke** Mean age: 57.1 years N = 28 Type of stroke: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	unaffected limb, performed by participants themselves under supervision of a guardian for 1st 4 weeks, 5 days/week, 25 minutes twice a day. Plus 75 minutes, 5 times/week usual rehabilitation programme. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=14) Usual rehabilitation programme 75 minutes, 5 times/week. No additional therapy. **Concomitant therapy** No additional information	Time period since stroke: 3.6 months Severity: Not stated/unclear	Dropout rate at end of intervention	
Lee 2019[64]	**Mirror therapy** (n=12) Mirror therapy for 4 weeks Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=12) Motor imagery only for 4 weeks **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 72.1 (4.5) years N = 24 Type of stroke: Infarction = 15 Haemorrhage = 9 Time period since stroke (SD): 3.8 (0.9) months Severity: Not stated/unclear.	Upper limb and hand motor function at end of intervention	Setting: A neurological physical therapy inpatient clinic in the Republic of Korea. Funding: No additional information. In Forest plots this study will be named Lee 2019B.

Study	Intervention and comparison	Population	Outcomes	Comments
Lee 2019[61]	**Mirror therapy** (n=15) Mirror therapy with afferent electrical stimulation for 60 minutes per day, 5 days per week, for 4 weeks Level of supervision: Supervised Limb therapy is used for: Lower extremity **Sham therapy** (n=15) Sham mirror therapy and sham electrical stimulation **Concomitant therapy** No additional information	**Chronic stroke** Mean age (SD): 50.5 (7.9) years N = 30 Type of stroke: Infarction = 10 Haemorrhage = 20 Time period since stroke (SD): 43.1 (31.0) months Severity: Not stated	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: People admitted to a rehabilitation hospital in South Korea. Funding: No financial organisation gave funding for the material discussed in the manuscript. In Forest plots this study will be named Lee 2019A.
Li 2019[65]	**Mirror therapy** (n=12) Hospital-based mirror therapy 1.5 hours/day, 3 days/week for 4 weeks. Included mirror box training for 45 minutes and functional training for 45 minutes. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=11) Similar care, but no mirror box was used. **Concomitant therapy** No additional information	**Chronic stroke** Mean age (SD): 54.6 (10.7) years N = 23 Type of stroke: Ischaemic = 12 Haemorrhagic = 11 Time period since stroke (SD): 53.0 (32.3) months Severity – NIHSS (SD): 4.6 (3.1)	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Stroke-specific Patient-Reported Outcome Measures at end of intervention Dropout rate at end of intervention	Setting: People from 4 participating sites, including 1 medical center and 3 regional hospitals in Taiwan. Funding: This study was partly supported by the National Health Research Institutes (NIHRI-EX106-10403PI, NHRI-EX107-10403PI, and NHRI-EX106-10604PI) and the Ministry of Science and Technology (103-2314-B-002-008-MY3, 103-2314-B-182-004-MY3, 104-2314-B-002-019-MY3, 105-2314-B-182-037-MY3, 105-2314-B-182-018, 107-2314-B-002-052, and 108-2314-B-002-165-MY3) of Taiwan.

Study	Intervention and comparison	Population	Outcomes	Comments
Lim 2016[66]	**Mirror Therapy** (n=30) Bilateral task-oriented mirror therapy. 4 weeks, 5 days a week, 20 minutes/day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=30) Same exercises, sham mirror therapy using a non-reflecting boarding between limbs. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age: 64.9 years N = 60 Type of stroke: Ischaemic = 19 Time period since stroke: 52 days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: Not stated.
Lin 2014[67]	**Mirror therapy** (n=28) Two groups. Mirror therapy alone: 10 minutes warm-up, 1 hour mirror-box training (bilateral movement (transitive and intransitive gross motor tasks)), 20 minutes functional task practice. Mirror therapy while using a mesh-glove for sensory stimulation. 4 weeks, 5 days a week, 1½ hours daily. Level of supervision: Supervised Limb therapy is used for: Upper extremity	**Chronic stroke** Mean age: 55 years N = 43 Type of stroke: Not stated/unclear Time period since stroke: 19.6 months Severity: Not stated/unclear	Activities of daily living at end of intervention	Setting: Inpatient and outpatient services in Taiwan. Funding: National Health Research Institutes, National Science Council, Healthy Ageing Research Center at Chang Gung University, Taiwan.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual care (n=15) Task-oriented treatment 4 weeks, 5 days a week, 1½ hours daily **Concomitant therapy** No additional information.			
Liu 2021[68]	**Mirror therapy** (n=31) Two groups. One (n=16) received mirror therapy with electromyographic biofeedback while the other (n=15) received just mirror therapy. Both received it for 30 minutes once daily, 5 days a week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=15) **Concomitant therapy** All people received occupational therapy and physical therapy for 4 hours a day, 5 days a week for 4 weeks.	**Acute/subacute stroke** Mean age (SD): 62.1 (9.2) years N = 46 Type of stroke: Not stated/unclear Time period since stroke (SD): 44.6 (30.6) weeks Severity: Not stated/unclear	Lower limb motor function at the end of intervention Measures of motor impairment at the end of intervention Activities of daily living at the end of intervention Dropout rate at the end of intervention	Setting: Outpatients in China. Funding: Supported by the Wenzhou Science and Technology Project (No. Y20170217)
Madhoun 2020[69]	**Mirror therapy** (n=18) Task-based mirror therapy. This group underwent 25 minutes of functional task with the mirror every day in addition to conventional therapy if needed, such as manual	**Acute/subacute stroke** Mean age (SD): 51.63 (9.0) N = 35 Type of stroke: Ischaemic = 9 Haemorrhagic = 21	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention	Setting: The Rehabilitation Medicine and Physical Therapy Department at Second Affiliated Hospital of Chongqing Medical University, China. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	therapy and acupuncture. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) Occupational therapy without a mirror for 25 minutes in addition to conventional therapy if the patients required. **Concomitant therapy** No additional information	Time period since stroke (SD): 3.9 (1.8) months Severity: Not stated/unclear	Dropout rate at end of intervention	
Manton 2002[70]	**Mirror therapy** (n=5) Home exercise programme with a mirror exercise unit for 4 weeks Level of supervision: Not stated/unclear Limb therapy is used for: Not stated/unclear **Usual care** (n=5) Same programme with a plexiglass exercise unit for 4 weeks **Concomitant therapy** No additional information	**Stroke** Mean age: Not stated/unclear N = 10 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	No outcomes reported (included in the Cochrane review)	Setting: Home based in the United States of America. Funding: Not stated.
Manzoor 2021[71]	**Mirror therapy** (n=8) Mirror therapy with parasagital mirror frequency of 30 minute/daily, 5 days/week and four weeks.	**Stroke** Mean age: Not stated N = 16 Type of stroke: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: The Khalid Rehabilitation Center of Faisalabad in Pakistan. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=8) Same exercises, but the mirror is covered. **Concomitant therapy** No additional information	Time period since stroke: Not stated/unclear Severity: Not stated/unclear		
Marquez 2012[72]	**Mirror therapy** (n=5) Mirror therapy. Alternate ankle dorsiflexion and plantarflexion of both ankles as best they could while looking into the mirror for 15 minutes during the individual physiotherapy sessions. Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care/sham therapy** (n=10) Two arms. 5 received sham mirror therapy (same as mirror therapy but with the non-reflecting side of the mirror) or individual physiotherapy only.	**Acute/subacute stroke** Mean age: 68.7 years N = 15 Type of stroke: Ischaemic = 10 Haemorrhagic = 5 Time period since stroke: 24.3 days Severity: Not stated/unclear	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation unit in Australia. Funding: National Stroke Foundation, Australia.

Study	Intervention and comparison	Population	Outcomes	Comments
	Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day. **Concomitant therapy** No additional information			
Mathieson 2018[73]	**Mirror therapy** (n=23) Combined functional electrical stimulation with mirror therapy. Mirror therapy was provided 30-minute mirror therapy sessions with a physiotherapist twice a day, five days a week for three weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care (**n=12) Functional electrical stimulation only for the same time period. A third group received mirror therapy only (N=15). This group was not included in the analysis as it was not comparable to the usual care arm. **Concomitant therapy** No additional information.	**Acute/subacute stroke** Mean age (SD): 73.0 (12.2) years N = 35 Type of stroke: Ischaemic = 27 Haemorrhagic = 8 Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: People on the stroke unit in New Zealand. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
Mekbib 2021[74]	**Mirror therapy** (n=12) Virtual reality with a device capable of mirror therapy interventions. The virtual reality group underwent the newly designed intervention plus occupational therapy. Following the training, all people in the virtual reality group received 1 hour virtual reality plus 1 hour occupational therapy per day, 4 days per week for 2 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=11) Occupational therapy only. Received time-matched occupational therapy alone. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 56.4 (11.8) years N = 23 Type of stroke: Ischaemic = 17 Haemorrhagic = 6 Time period since stroke (SD): 38.1 (20.3) days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: The Department of Rehabilitation Medicine at Zhejiang Province People's Hospital (Hangzhou, China). Funding: This work was supported in part by a grant sponsored by the China National Key R&D Program (No. 2017YFC1308500/2017YFC1308502) and in part by the China National Natural Science Foundation (Grants: 71971066, 81430010, and 31627802). The work was also supported partly by an international collaboration grant sponsored by the China National Ministry of Science and Technology (No. 4-9/2018), and a grant sponsored by the China National Ministry of Education (No. 18YJA630019).
Michielsen 2011[75]	**Mirror therapy** (n=20) Mirror therapy participants were instructed to move both arms while looking in the mirror (moving arm covered). Once a week physiotherapeutic supervision for 60 minutes; 5 times a week, 60 minutes of practice at home for 6 weeks	**Chronic stroke** Mean age: 57 years N = 30 Type of stroke: Ischaemic = 28 Time period since stroke: 4.6 years Severity: Not stated/unclear	Person/participant generic health-related quality of life at end of intervention and 6 months Upper limb and hand motor function at end of intervention and 6 months Fugl-Meyer Assessment Upper Extremity at end of	Setting: Home-based in the Netherlands. Funding: Fonds NutsOhra [SNO-T-0602-23]; Innovatiefonds Zorgverzekeraars [06-262]; Weten-schappelijk College Fysiotherapie [WU/2007/07] and Hersenstichting Nederland [15F07.54].

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=20) Bilateral arm training: participants performed the same treatment protocol as in group 1, but without a mirror **Concomitant therapy** No additional information		intervention and 6 months Measures of motor impairment at end of intervention and 6 months Pain at end of intervention and 6 months Dropout rate at end of intervention	
Mohan 2013[76]	**Mirror therapy** (n=11) Mirror therapy and conventional stroke rehabilitation programme 2 weeks, 6 days a week, 60 minutes a day and additional 30 minutes of mirror therapy. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Sham therapy** (n=11) Sham therapy as per intervention above: using non-reflecting surface of the mirror. 2 weeks, 6 days a week, 60 minutes a day and additional 30 minutes of sham therapy **Concomitant therapy**	**Acute/subacute stroke** Mean age: 63 years N = 22 Type of stroke: Ischaemic = 14 Haemorrhagic = 8 Time period since stroke: 6.4 days Severity: Not stated/unclear	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention Adverse events at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in India. Funding: Not financed (according to authors).

Study	Intervention and comparison	Population	Outcomes	Comments
	Conventional stroke rehabilitation programme: neurodevelopmental facilitation techniques, sensory motor re-education, active exercises, mobility training, balance, and gait training			
Moustapha 2012[77]	**Mirror therapy** (n=4) Sequence of analytical movements with right upper limb while looking to the image in the mirror - 5 days a week, 30 minutes a day for 5 consecutive days, 1 session a day. 1 week wash out then sham therapy for 5 days (only the first period was included in the analysis). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=4) The image of the right arm was replaced by landscape images, participants were asked to describe the images in the mirror, no movement - 5 days a week, 30 minutes a day for 5 consecutive days, 1 session a day. 1 week wash out period then received mirror therapy protocol for	**Acute/subacute stroke** Mean age: 53.5 years N = 8 Type of stroke: Not stated/unclear Time period since stroke: 4.5 months Severity: Not stated/unclear	Visuospatial neglect at end of intervention Dropout rate at end of intervention	Setting: France. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	5 consecutive days . **Concomitant therapy** No additional information			
Nagapattinam 2015[78]	**Mirror therapy** (n=40) Two groups: Task-oriented mirror therapy with functional electrical stimulation, or task-oriented mirror therapy. 2 weeks, 6 days a week, 30 minutes daily. Plus conventional therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=20) Functional electrical stimulation plus conventional therapy for the same time period. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age: 44.9 years N = 60 Type of stroke: Ischaemic = 60 Time period since stroke: 4.2 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Dropout rate at end of intervention	Setting: Inpatient care in India. Funding: Not stated.
Oliveira 2018[80]	**Mirror therapy** (n=7) Bimanual activities with 2 sets of 10 repetitions for each exercises plus conventional physiotherapy Level of supervision: Supervised Limb therapy is used for: Upper extremity	**Stroke** Mean age (range): 60.1 (55-65) years N = 14 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Lower limb motor function at end of intervention Measures of motor impairment at end of intervention	Setting: The Clinical School of Faculdada Mauricio de Nassau, Teresina, PI, Brazil. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Usual care (n=7) Conventional physiotherapy for the rehabilitation of stroke. A third group (n=7) received vibratory therapy using a Digital Vibration Pad. This group was not included in the analysis as it did not fulfil the comparisons stated in the protocol. **Concomitant therapy** No additional information			
Pandian 2014[81]	**Mirror therapy** (n=27) Bilateral flexion and extension of wrist and fingers, active or assistive limb activation for 4 weeks, 5 days a week, 1 hour a day MT and 1 hour limb activation Level of supervision: Supervised Limb therapy is used for: Both **Sham therapy** (n=21) Using non-reflecting surface of the mirror and active or assistive limb activation. 4 weeks, 5 days a week, 1 hour a day sham therapy and 1 hour limb activation **Concomitant therapy**	**Acute/subacute stroke** Mean age: 63.4 years N = 48 Type of stroke: Ischaemic = 26 Time period since stroke: 2 days Severity: Not stated/unclear	Activities of daily living at 6 months Visuospatial neglect at 6 months Adverse events at 6 months Dropout rate at 6 months	MUST trial Setting: Inpatient rehabilitation centre and home training after discharge in India. Funding: Christian Medical College, Department of Neurology, India, Intramural research fund.

Study	Intervention and comparison	Population	Outcomes	Comments
	No additional information			
Park 2015[82]	**Mirror therapy** (n=15) Movements of the non-paretic side - 4 weeks, 5 days a week, 30 minutes. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=15) Participants performed the same exercises as the MT group while watching the non-reflecting surface of the mirror - 4 weeks, 5 days a week, 30 minutes. **Concomitant therapy** Conventional occupational therapy	**Chronic stroke** Mean age: 56.3 years N = 30 Type of stroke: Ischaemic = 16 Time period since stroke: 20.9 months Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention	Setting: Inpatient care in the Republic of Korea. Funding: Not stated. In Forest plots this study will be named Park 2015A.
Park 2015[83]	**Mirror therapy** (n=15) Task-oriented mirror therapy: unilateral, performed 8 different tasks, e.g. lift/grasp a cup, reach to grasp a cone. 6 weeks, 5 days a week task-oriented MT. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=15)	**Chronic stroke** Mean age: 60 years N = 30 Type of stroke: Ischaemic = 17 Time period since stroke: 8.2 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Activities of daily living at end of intervention	Setting: Rehabilitation unit in South Korea. Funding: Not stated. In Forest plots this study will be named Park 2015B.

Study	Intervention and comparison	Population	Outcomes	Comments
	Same 8 tasks as intervention group. 6 weeks, 5 days a week task-oriented sham therapy **Concomitant therapy** No additional information.			
Piravej 2012[84]	**Mirror therapy** (n=23) Mirror therapy with task-oriented activity consisted of grasping and releasing the tennis balls, pins and cylindrical shape 30 minutes/session, 10 sessions. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=24) Same tasks without mirror (use the other side of the mirror box) 30 minutes/session, 10 sessions. **Concomitant therapy** No additional information	**Chronic stroke** Mean age: 56 years N = 47 Type of stroke: Ischaemic = 27 Haemorrhagic = 13 Time period since stroke: 7.2 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Thailand. Funding: Not stated.
Rajappan 2015[85]	**Mirror therapy** (n=15) Bilateral finger flexion, extension, abduction, adduction; wrist flexion, extension, ulnar deviation and radial deviation; task-specific movements such as power and prehension grip using different size	**Acute/subacute stroke** Mean age (SD): 58.0 (5.5) years N = 30 Type of stroke: Ischaemic = 20 Haemorrhagic = 10 Time period since stroke (SD): 5 (2.3) months	Dropout rate at end of intervention	Setting: Nursing homes in Malaysia. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	and weighted objects while looking into the mirror additional 30 minutes a day mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=15) Same tasks as MT but using the non-reflecting side of the mirror additional 30 minutes a day sham therapy. **Concomitant therapy** 4 weeks, 5 days a week, 1 hour a day conventional rehabilitation programme.	Severity: Not stated/unclear		
Rehani 2015[86]	**Mirror therapy** (n=10) Mirror therapy. Bilateral intransitive exercises such as hand opening, wrist extension and flexion, forearm pronation and supination, hand sliding on a flat surface while looking into the mirror. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=10) Motor relearning programme	**Acute/subacute stroke** Mean age (SD): 56.3 (5.7) years N = 20 Type of stroke: Ischaemic = 13 Haemorrhagic = 7 Time period since stroke: 83.4 (32.7) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention	Setting: Outpatient care in India. Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	exercises for training of wrist extensors, extension of wrist and holding objects, training of supination of forearm, opposition of thumb, cupping of hand and training of manipulation of the objects. **Concomitant therapy** Conventional therapy was available for both study arms. Therapy was delivered for an additional 30 minutes a day of mirror therapy. Conventional therapy was delivered for 4 weeks, 6 days a week, 30 minutes a day.			
Rodrigues 2016[87]	**Mirror therapy** (n=8) Object-related bilateral symmetric upper limb training while looking into the mirror 4 weeks, 3 days a week, 1 hour a day mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=8) Object-related bilateral symmetric upper-limb training using covered mirror 4 weeks, 3 days a week, 1	**Chronic stroke** Mean age (SD): 57.5 (7.0) years N = 16 Type of stroke: Ischaemic = 16 Haemorrhagic = 0 Time period since stroke (SD): 34.8 (27.3) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Home based in Brazil. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	hour a day sham therapy. **Concomitant therapy** No additional information			
Rong 2021[88]	**Mirror therapy** (n=20) Camera-based mirror visual feedback for 1.5 hours per day, 5 days a week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=20) The affected side is shielded to restrain the development of a mirror illusion. **Concomitant therapy** No additional information.	**Acute/subacute stroke** Mean age (SD): N = 40 Level of supervision: Supervised Type of stroke: Not stated/unclear Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at the end of intervention Measures of motor impairment at the end of intervention Activities of daily living at the end of intervention	Setting: Inpatients in China. Funding: Government and academic funding.
Rothgangel 2004[89]	**Mirror therapy** (n=6) Participants were instructed to move either both arms (muscle hypotonia), or just the unaffected arm (muscle hypertonia); therapist was moving the affected arm; gross, functional and fine-motor movements were trained. 17-37 treatments in 5 weeks for 30 minutes each.	**Chronic stroke** Mean age: 73.4 years N = 16 Type of stroke: Ischaemic = 16 Haemorrhagic = 0 Time period since stroke: 9.5 months Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: Inpatient (n=6) and outpatient (n=10) rehabilitation centre in the Netherlands. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=10) Bilateral arm training: same treatment protocol as in group 1, but without a mirror. **Concomitant therapy** No additional information			
Saha 2021[90]	**Mirror therapy** (n=19) Performing all exercises of the stroke rehabilitation program while seated in a chair or stool close to a mirror (55cm x 55cm) positioned vertically between the patient's upper limbs. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=19) Performing all exercises of the stroke rehabilitation program, while directly visualising their affected and unaffected limbs. **Concomitant therapy** 4 week stroke rehabilitation program, 30 minutes a day for 5 days a week.	**Chronic stroke** Mean age (SD): 58.6 (5.7) years N = 38 Type of stroke: Ischaemic = 7 Haemorrhagic = 23 Time period since stroke (SD): 13.4 (2.0) months Severity: Not stated/unclear	Activities of daily living at end of intervention Pain at end of intervention Dropout rate at end of intervention	Setting: An outpatient rehabilitation clinic in Kolkata, India. Funding: This study was supported by the Institute of Neurosciences Kolkata and Physiomax Organization.

Study	Intervention and comparison	Population	Outcomes	Comments
Salhab 2016[91]	**Mirror therapy** (n=9) Mirror therapy and electrical stimulation 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of conventional therapy (only the first phase is included in the analysis). Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=9) Conventional therapy 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of mirror therapy and electrical stimulation (only the first phase is included in the analysis). **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age: 58.8 years N = 18 Type of stroke: Ischaemic = 13 Haemorrhagic = 5 Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: Several centers and hospitals in Lebanon. Funding: Not stated.
Samuelkamaleshkumar 2014[92]	**Mirror therapy** (n=10) Participants performed unilateral movements while watching in the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional mirror therapy a day. Level of supervision: Supervised	**Acute/subacute stroke** Mean age (SD): 51.2 (14.0) years N = 20 Type of stroke: Ischaemic = 14 Haemorrhagic = 6 Time period since stroke (SD): 4.1 (1.3) weeks Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in India. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Upper extremity **Sham therapy** (n=10) Participants performed the same exercises as in MT group using the nonreflecting surface of the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional sham therapy a day. **Concomitant therapy** Conventional stroke rehabilitation 3 weeks, 5 days a week, 6 hours conventional stroke rehabilitation.			
Schick 2017[93]	**Mirror therapy** (n=15) Multi-channel EMG-triggered electrostimulation (EMG-MES) + mirror therapy. 3 weeks, 5 days a week, 30 minutes a day EMG-MES and mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) EMG-MES: 3 weeks, 5 days a week, 30 minutes a day EMG-MES **Concomitant therapy** Conventional therapy (3 weeks, 5 days a week).	**Acute/subacute stroke** Mean age (SD): 62.5 (15.9) years N = 32 Type of stroke: Ischaemic = 27 Haemorrhagic = 5 Time period since stroke (SD): 49.9 (34.6) days Severity: Severe = 13 Very severe = 19	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Adverse events at end of intervention Dropout rate at end of intervention	Setting: 3 inpatient rehabilitation centres in Austria/Germany. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
Seok 2010[94]	**Mirror therapy** (n=19) Mirror therapy (no additional information). 5 days a week, 30 minutes of therapy for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **No treatment** (n=21) No additional therapy. 5 days a week, 30 minutes of therapy for 4 weeks. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age: 51.4 years N = 40 Type of stroke: Not stated/unclear Time period since stroke: 4 months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention	Setting: Inpatient rehabilitation centre in South Korea. Funding: Not stated.
Simpson 2019[95]	**Mirror therapy** (n=18) Unilateral strength training with mirror therapy three times a week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=17) Unilateral strength training only three times a week for 4 weeks. **Concomitant therapy** No additional information	**Chronic stroke** Mean age (SD): 61.7 (13.6) years N = 35 Type of stroke: Ischaemic = 20 Haemorrhagic = 11 Time period since stroke (SD): 84.2 (79.4) months	Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Home-based programme. Clinicians at Sligo University Hospital, Ireland. Funding: Study was supported by the institutes of technology Ireland post graduate research scholarship (D Simpson and P. Boderick), IT Sligo capacity building fund, and Irish research council postgraduate scholarship (M. Ehrensberger; Grant GOIPG/2016/1662).

Study	Intervention and comparison	Population	Outcomes	Comments
Sütbeyaz 2007[96]	**Mirror therapy** (n=20) Participants were instructed to move the non-paretic leg while looking in the mirror 5 days a week, 30 minutes of therapy for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=20) Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror to the non-affected leg 5 days a week, 30 minutes of therapy for 4 weeks. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 63.7 (8.8) years N = 40 Type of stroke: Ischaemic = 33 Haemorrhagic = 7 Time period since stroke (SD): 3.7 (1.6) months Severity: Not stated/unclear	Measures of motor impairment at end of intervention and 6 months Activities of daily living at end of intervention and 6 months Dropout rate at end of intervention and 6 months	Setting: Inpatient rehabilitation centre in Turkey. Funding: Not stated.
Tezuka 2006[97]	**Mirror therapy** (n=9) Participants were instructed to move the non-paretic arm while looking in the mirror and passive movement of the paretic arm provided by therapist. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa (only the first phase was analysed). Level of supervision: Supervised	**Acute/subacute stroke** Mean age: 63.7 years N = 15 Type of stroke: Not stated/unclear Time period since stroke: 32.7 days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Japan. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Upper extremity **Usual care** (n=6) Passive arm movements: using only passive movements of the affected arm without a mirror. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa. **Concomitant therapy** No additional information			
Thieme 2013[98]	**Mirror therapy** (n=39) Two groups. The first had a group mirror therapy intervention, while the second had mirror therapy as individual treatment. Participants perform movements with both arms (the affected arm as best as could be) while watching the mirror image of the unaffected arm, participants exercised in open groups of 2 to 6 participants. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity	**Acute/subacute stroke** Mean age (SD): 67.3 (10.6) years N = 60 Type of stroke: Ischaemic = 44 Haemorrhagic = 15 Time period since stroke (SD): 45.0 (24.0) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Pain at end of intervention Visuospatial neglect at end of intervention Stroke-specific Patient-Reported Outcome Measures at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in Germany. Funding: Klinik Bavaria Kreischa, Germany.

Study	Intervention and comparison	Population	Outcomes	Comments
	Sham therapy (n=21) Group intervention; participants exercise in open groups of 2 to 6 participants with the non-reflecting side of the mirror positioned to the unaffected arm. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. **Concomitant therapy** Standard rehabilitation programme.			
Tyson 2015[100]	**Mirror therapy** (n=63) Participants were taught how to do the mirror therapy and given an (aphasia-friendly) instruction booklet to show them how to position the mirror themselves and also the exercises to do. For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy. Level of supervision: Unsupervised (patient led) Limb therapy is used for: Upper extremity **Usual care** (n=31) Lower limb exercises (without a mirror). For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy.	**Acute/subacute stroke** Mean age (SD): 64.0 (14.4) years N = 94 Type of stroke: Not stated/unclear Time period since stroke (median [range]): 24 (7 to 113) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Measures of motor impairment at end of intervention Visuospatial neglect at end of intervention Dropout rate at end of intervention	Settings: 12 inpatient stroke services in the United Kingdom. Funding: National Institute for Health Research under its Research for Patient Benefit (RfPB) Programme.

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy Conventional rehabilitation programme.			
Vural 2016[101]	**Mirror therapy** (n=15) Mirror therapy where the person is seated on a chair close to a table with a mirror (35x35cm) positioned vertically between the patient's upper limbs. Additional mirror therapy for 30 minutes/day. Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=15) Conventional programme consisting of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required). Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day. **Concomitant therapy** No additional information	**Mixed stroke** Mean age (SD): 65.2 (11.8) years N = 30 Type of stroke: Ischaemic = 23 Haemorrhagic = 7 Time period since stroke (median [IQR]): 150 (60-240) days Severity: Not stated/unclear	Dropout rate at end of intervention	Setting: Inpatient rehabilitation center in Turkey. Funding: No additional information.
Wang 2015[103]	**Mirror therapy** (n=18) Mirror therapy group was treated	**Acute/subacute stroke**	Upper limb and hand motor function at end of intervention	Setting: Rehabilitation unit in China.

Study	Intervention and comparison	Population	Outcomes	Comments
	with assisted mirror therapy, 40 min/day, 5 days/week. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=18) Conventional rehabilitation treatment only **Concomitant therapy** Both groups received conventional rehabilitation treatment, including the therapy of normal limb position put and lower limb-facilitation technique, training of balance function, gait and activities of daily living, training of play instruments like power bicycle and other physical factors treatment, 2-3 h/d, 5 d/w.	Mean age (SD): 52.7 (2.9) years N = 36 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Dropout rate at end of intervention	Funding: Not stated.
Wang 2017[102]	**Mirror therapy** (n=30) Additional mirror therapy upper extremity for 8 weeks, 6 days a week, 30 minutes of additional mirror therapy. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=60)	**Acute/subacute stroke** Mean age: 64.9 years N = 90 Type of stroke: Ischaemic = 57 Haemorrhage = 33 Time period since stroke: 63.7 days Severity: Not stated/unclear	Measures of motor impairment at end of intervention Activities of daily living at end of intervention	Setting: China. Funding: Changsha Economics Office.

Study	Intervention and comparison	Population	Outcomes	Comments
	Two groups. One received additional electromyographic biofeedback (EMGBF) 8 weeks, 6 days a week, 20 minutes additional EMGBF. One did not include any additional therapy. **Concomitant therapy** Routine rehabilitation and task-oriented training for 8 weeks, 6 days a week, 60 minutes of routine rehabilitation.			
Wu 2013[104]	**Mirror therapy** (n=16) Participants were instructed to observe their unaffected upper limb in mirror box while performing bilateral movements for 4 weeks, 5 days a week, 60 minutes a day of MT, followed by 30 minutes task-oriented training. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=17) Usual occupational therapy, task-oriented training: co-ordination, unilateral and bilateral fine-motor tasks, static and dynamic standing and sitting, balance, compensatory practice on	**Chronic stroke** Mean age (SD): 54.2 (11.0) years N = 33 Type of stroke: Haemorrhagic = 13 Ischaemic = 20 Time period since stroke (SD): 54.2 (11.0) months Severity – NIHSS (SD): 1.4 (1.4)	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: 4 hospitals in Taiwan. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	functional tasks 4 weeks, 5 days a week, 90 minutes a day. **Concomitant therapy** No additional information			
Xu 2017[105]	**Mirror therapy** (n=46) Two groups: 1) Mirror therapy only. 2) Mirror therapy and neuromuscular electrical stimulation. Therapy was for 0.5 hours/day and five days/week for 4 weeks. Level of supervision: Supervised Limb therapy is used for: Lower extremity **Usual care** (n=23) 4 weeks conventional rehabilitation therapy. **Concomitant therapy** No additional information	**Acute/subacute stroke** Mean age (SD): 54.9 (9.5) years N = 69 Type of stroke: Ischaemic = 51 Haemorrhagic = 18 Time period since stroke (SD): 43.9 (6.2) days Severity: Not stated/unclear	Measures of motor impairment at end of intervention Dropout rate at end of intervention	Setting: An inpatient rehabilitation centre of Tongji Hospital in China. Funding: The author(s) received no financial support for the research, authorship and/or publication of this article.
Yavuzer 2008[106]	**Mirror therapy** (n=20) Participants were instructed to move both arms while looking in the mirror. 5 days a week, 30 minutes of therapy for 4 weeks. Level of supervision: Supervised	**Mixed stroke** Mean age (SD): 63.3 (9.4) years N = 40 Type of stroke: Ischaemic = 29 Haemorrhagic = 7 Time period since stroke (SD): 5.5 (2.7) months Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention and 6 months Activities of daily living at end of intervention and 6 months Dropout rate at end of intervention and 6 months	Setting: Inpatient rehabilitation centre in Turkey. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Limb therapy is used for: Upper extremity **Sham therapy** (n=20) Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror. 5 days a week, 30 minutes of therapy for 4 weeks. **Concomitant therapy** No additional information			
Yoon 2014[107]	**Mirror therapy** (n=8) Additional constraint induced movement therapy (CIMT) and mirror therapy (MT) for an additional 2 hours, 3 times a day CIMT and 30 minutes MT a day. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=9) Two groups (only the first is included in the analysis). The first (n=9) have additional constraint induced movement therapy and self-exercise for an additional 2 hours, 3 times a day CIMT and 30 minutes self-exercise a day. The second group (n=9) received additional	**Acute/subacute stroke** Mean age (SD): 56.3 (14.4) years N = 17 Type of stroke: Infarction = 8 Haemorrhage = 9 Time period since stroke (SD): 21.7 (10.6) days Severity: Not stated/unclear	Upper limb and hand motor function at end of intervention Fugl-Meyer Assessment Upper Extremity at end of intervention Measures of motor impairment at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in the Republic of Korea. Funding: 2-year research grant of Pusan National University, Republik of Korea.

Study	Intervention and comparison	Population	Outcomes	Comments
	self-exercise for an additional 30 minutes, 2 times a day of self-exercise. The second group was not included in the analysis. **Concomitant therapy** Conventional therapy 2 weeks, 5 days a weeks, with 40 minutes a day of conventional therapy			
Yun 2011[108]	**Mirror therapy** (n=40) Two groups combined. One group (n=20) received mirror therapy with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy. The second group (n=20) received mirror therapy and neuromuscular electrical stimulation therapy with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy and neuromuscular electrical stimulation. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Sham therapy** (n=20)	**Acute/subacute stroke** Mean age (SD): 63.3 (9.2) years N = 60 Type of stroke: Infarction = 46 Haemorrhage = 14 Time period since stroke (SD): 25.9 (12.8) days Severity: Not stated/unclear	Fugl-Meyer Assessment Upper Extremity at end of intervention Activities of daily living at end of intervention Dropout rate at end of intervention	Setting: Inpatient rehabilitation centre in South Korea. Funding: Not stated.

Study	Intervention and comparison	Population	Outcomes	Comments
	Neuromuscular electrical stimulation was applied to extensor muscles on the paretic side and simultaneously underwent flexion and extension of fingers and wrist an the non-paretic side while looking at the wooden board with a conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of sham therapy. **Concomitant therapy** No additional information			
Zacharis 2014[109]	**Mirror therapy** (n=15) Additional mirror therapy (30 minutes a day) and routine rehabilitation treatment (8 weeks - 20-24 sessions). Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=15) Routine rehabilitation treatment (8 weeks - 20-24 sessions). **Concomitant therapy** No additional information	**Stroke** Mean age: Not stated/unclear N = 30 Type of stroke: Not stated/unclear Time period since stroke: Not stated/unclear Severity: Not stated/unclear	No outcomes reported (included in the Cochrane review)	Setting: Greece. Funding: Not stated.
Zhang 2021[110]	**Mirror therapy** (n=30) Mirror therapy for 30 minutes once a	**Acute/subacute stroke** Mean age (SD): 58.5 (11.2) years	Fugl-Meyer Assessment Upper Extremity	Setting: Inpatients in China.

Study	Intervention and comparison	Population	Outcomes	Comments
	day, five times per week over 4 weeks plus usual care. Level of supervision: Supervised Limb therapy is used for: Upper extremity **Usual care** (n=30) **Concomitant therapy** Regular occupational therapy two times per day for 30 minute sessions, five times per week over 4 weeks.	N = 60 Type of stroke: Not stated/unclear Time period since stroke (SD): 30.5 (8.4) days Severity: Not stated/unclear	at the end of intervention Activities of daily living at the end of intervention	Funding: No financial support.

See Appendix D for full evidence tables.

1.1.6 Summary of the effectiveness evidence

Table 3: Clinical evidence summary: Mirror therapy compared to all other interventions

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
Person/participant generic health-related quality of life (EQ-5D, SF-8 [different scale ranges], higher values are better, final values) at the end of the intervention	72 (2 RCTs) follow-up: mean 6 weeks	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.05 SD higher** (0.83 lower to 0.94 higher)	MID = 0.5 SD (SMD)
Person/participant generic health-related quality of life (EQ-5D, -0.11-1, higher values are better, final value) at 6 months	32 (1 RCT) follow-up: mean 6 months	⊕◯◯◯ Very low[a,c]	-	The mean quality of life at 6 months was 0.79	MD **0.03 lower** (0.15 lower to 0.09 higher)	MID = 0.03 (EQ-5D established MID)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
Upper limb and hand motor function (ARAT, 0-57, higher values are better, change score) at the end of intervention	21 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[c,d]	-	The mean upper limb and hand motor function at the end of intervention was 2.43	MD **0.53 lower** (9.17 lower to 8.11 higher)	MID = 7 (0.5 x median baseline SD)
Upper limb and hand motor function (ARAT, MAS, BBT, WMFT, MFT, TEMPA, Upper Extremity Functional Index Scale [different scale ranges], higher values are better, final values) at the end of intervention	1514 (46 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,c,e]	-	-	SMD **0.36 SD higher** (0.18 higher to 0.54 higher)	MID = 0.5 SD (SMD)
Upper limb and hand motor function (Motor Activity log - Amount of use subscale, 0-5, higher values are better, final value) at the end of intervention	24 (1 RCT) follow-up: 5 weeks	⊕⊕◯◯ Low[c,f]	-	The mean upper limb and hand motor function at the end of intervention was 1.54	MD **0.44 higher** (0.18 lower to 1.06 higher)	MID = 0.24 (0.5 x median baseline SD)
Upper limb and hand motor function (Motor Activity log - Quality of movement subscale, 0-5, higher values are better, final value) at the end of intervention	24 (1 RCT) follow-up: 5 weeks	⊕◯◯◯ Very low[c,f]	-	The mean upper limb and hand motor function at the end of intervention was 1.03	MD **0.32 higher** (0.31 lower to 0.95 higher)	MID = 0.24 (0.5 x median baseline SD)
Upper limb and hand motor function (ARAT, WMFT [different scale ranges], higher values are better, final values) at 6 months	80 (2 RCTs) follow-up: mean 6 months	⊕◯◯◯ Very low[b,c,d]	-	-	SMD **1.21 SD higher** (0.77 lower to 3.18 higher)	MID = 0.5 SD (SMD)
Lower limb motor function (BBS, 0-56, higher values are better, change scores) at the end of intervention	70 (2 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,c,g]	-	The mean lower limb motor function at the end of	MD **5.77 higher** (3.32 lower to 14.87 higher)	MID = 1.9 (0.5 x median baseline SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
				intervention was 5.5		
Lower limb motor function (BBS, MAS, Brunel Balance Assessment, Balance Index [different scale ranges], higher values are better, final values) at the end of the intervention	302 (11 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,d]	-	-	SMD **0.97 SD higher** (0.56 higher to 1.38 higher)	MID = 0.5 SD (SMD)
Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at the end of intervention	1567 (47 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,e]	-	The mean fugl-Meyer Assessment Upper Extremity at the end of intervention was 31.17	MD **4.53 higher** (2.74 higher to 6.32 higher)	MID = 6.6 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)
Fugl-Meyer Assessment Upper Extremity (Shoulder, elbow and forearm subscale, 0-36, higher values are better, final value) at the end of intervention	36 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[c,h]	-	The mean fugl-Meyer Assessment Upper Extremity at the end of intervention was 29.42	MD **1.87 higher** (1.22 lower to 4.96 higher)	MID = 3.6 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)
Fugl-Meyer Assessment Upper Extremity (Wrist subscale, 0-10, higher values are better, final value) at the end of intervention	36 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[c,h]	-	The mean fugl-Meyer Assessment Upper Extremity at the end of intervention was 6	MD **1.29 higher** (0.19 higher to 2.39 higher)	MID = 1.0 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)
Fugl-Meyer Assessment Upper Extremity (Hand subscale, 0-14, higher values are better, final value) at the end of intervention	36 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[c,h]	-	The mean fugl-Meyer Assessment Upper Extremity at the end of intervention was 8	MD **1.25 higher** (0.16 higher to 2.34 higher)	MID = 1.4 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
Fugl-Meyer Assessment Upper Extremity (Coordination subscale, 0-6, higher values are better, final value) at the end of intervention	36 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[c,h]	-	The mean fugl-Meyer Assessment Upper Extremity at the end of intervention was 3.67	MD **0.12 higher** (0.53 lower to 0.77 higher)	MID = 0.6 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)
Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at 6 months	152 (2 RCTs) follow-up: mean 9 months	⊕⊕⊕◯ Moderate[i]	-	The mean fugl-Meyer Assessment Upper Extremity at 6 months was 29.01	MD **4.27 higher** (2.93 higher to 5.62 higher)	MID = 6.6 (Fugl-Meyer upper extremity = Difference by 10% of the total scale)
Measures of motor impairment (Fugl Meyer Lower Extremity, modified Brunnstrom stages, House-Brackmann facial nerve grading system, motricity index [different scale ranges], higher values are better, final values) at the end of intervention	706 (19 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,c,e]	-	-	SMD **0.55 SD higher** (0.31 higher to 0.79 higher)	MID = 0.5 SD (SMD)
Measures of motor impairment (grip strength, quadriceps strength [kg], higher values are better, change score and final values) at the end of intervention	314 (11 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,c,d]	-	The mean measures of motor impairment at the end of intervention was 11.0 kg	MD **1.28 kg higher** (0.29 higher to 2.27 higher)	MID = 2.1 (0.5 x median baseline SD)
Measures of motor impairment (grip strength [lb], higher values are better, change score and final values) at the end of intervention	57 (2 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[c,d]	-	The mean measures of motor impairment at the end of intervention was 4.3 lbs	MD **2.56 lbs higher** (0.89 higher to 4.23 higher)	MID = 1.2 (0.5 x median baseline SD)
Measures of motor impairment	69 (2 RCTs)	⊕⊕◯◯ Low[d]	-	The mean measures	MD **0.9 higher**	MID = 0.42 (0.5 x

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
(Brunnstrom stages, 1-6, higher values are better, final values) at 6 months	follow-up: mean 6 months			of motor impairment at 6 months was 3.3	(0.45 higher to 1.35 higher)	median baseline SD)
Measures of motor impairment (grip strength [kg], higher values are better, final value) at 6 months	32 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[c,j]	-	The mean measures of motor impairment at 6 months was 15.3	MD **3.7 lower** (8.67 lower to 1.27 higher)	MID = 4.4 (0.5 x median baseline SD)
Activities of daily living (MBI, 0-100, higher values are better, change score) at the end of intervention	32 (1 RCT) follow-up: 3 weeks	⊕⊕◯◯ Low[g]	-	The mean activities of daily living at the end of intervention was 20.25	MD **23.5 higher** (14.3 higher to 32.7 higher)	MID = 1.85 (Barthel index established MID)
Activities of daily living (MBI, FIM, ABILHAND, motor activity log, modified Ashworth scale [different scale ranges], higher values are better, final values) at the end of intervention	1256 (37 RCTs) follow-up: 4 weeks	⊕◯◯◯ Very low[c,e]	-	-	SMD **0.51 SD higher** (0.34 higher to 0.68 higher)	MID = 0.5 SD (SMD)
Activities of daily living (FIM, modified ADL [different scale ranges], higher values are better, final values) at 6 months	147 (4 RCTs) follow-up: mean 6 months	⊕◯◯◯ Very low[c,d]	-	-	SMD **0.68 SD higher** (0.34 higher to 1.01 higher)	MID = 0.5 SD (SMD)
Pain (NRS, 0-10, lower values are better, change score) at the end of intervention	40 (1 RCT) follow-up: 2 weeks	⊕⊕◯◯ Low[c,k]	-	The mean pain at the end of intervention was 0.6	MD **0.5 lower** (1.13 lower to 0.13 higher)	MID = 0.7 (0.5 x median control group SD)
Pain (VAS, NRS, Fugl Meyer Assessment pain subscale [different scale ranges], lower values are better, final values) at the end of intervention	242 (6 RCTs) follow-up: mean 5 weeks	⊕◯◯◯ Very low[b,c,l]	-	-	SMD **1.03 SD lower** (1.85 lower to 0.21 lower)	MID = 0.5 SD (SMD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
Pain (VAS, 0-100, lower values are better, final values) at 6 months	80 (2 RCTs) follow-up: mean 6 months	⊕◯◯◯ Very low[b,c,l]	-	The mean pain at 6 months was 47.95	MD **20.55 lower** (47.11 lower to 6.01 higher)	MID = 7.8 (0.5 x median baseline SD)
Visuospatial neglect (star cancellation, 0-54, higher is better, final values) at the end of intervention	130 (4 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[b,c,m]	-	The mean visuospatial neglect at the end of intervention was 37.5	MD **5.03 higher** (1.19 higher to 8.88 higher)	MID = 5.5 (0.5 x median baseline SD)
Visuospatial neglect (star cancellation test, 0-54, higher values are better, final value) at 6 months	45 (1 RCT) follow-up: mean 6 months	⊕⊕◯◯ Low[n]	-	The mean visuospatial neglect at 6 months was 24.1	MD **13.7 higher** (10.94 higher to 16.46 higher)	MID = 1.75 (0.5 x median control group SD)
Stroke-specific Patient-Reported Outcome Measures (SIS, 0-100, higher values are better, change score) at the end of intervention	21 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[c,d]	-	The mean stroke-specific Patient-Reported Outcome Measures at the end of intervention was **-6.13**	MD **9.02 higher** (22.51 lower to 40.55 higher)	MID = 7.8 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS, SS-QOL, LHS [different scale ranges], higher values are better, final values) at the end of intervention	192 (6 RCTs) follow-up: mean 6 weeks	⊕⊕◯◯ Low[l]	-	-	SMD **0.12 SD higher** (0.18 lower to 0.41 higher)	MID = 0.5 SD (SMD)
Adverse events at the end of intervention	306 (7 RCTs) follow-up: mean 9 weeks	⊕⊕⊕◯ Moderate[o]	RD 0.00 (-0.03 to 0.03)	0 per 1,000	**0 fewer per 1,000** (30 fewer to 30 more) [p]	Sample size used to determine precision: 75-150 = serious imprecision, <75 = very serious

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	
						imprecision .
Adverse events at 6 months	168 (2 RCTs) follow-up: mean 9 months	⊕⊕⊕◯ Moderate[o]	RD 0.00 (-0.03 to 0.03)	0 per 1,000	**0 fewer per 1,000** (30 fewer to 30 more) [p]	Sample size used to determine precision: 75-150 = serious imprecision , <75 = very serious imprecision .
Dropouts at the end of intervention	2445 (71 RCTs) follow-up: mean 4 weeks	⊕◯◯◯ Very low[e,o]	RD 0.01 (-0.01 to 0.04)	71 per 1,000	**10 more per 1,000** (10 fewer to 40 more) [p]	Precision calculated through Optimal Information Size (OIS) due to zero events in some studies. OIS determined power for the sample size = 0.12 (0.8-0.9 = serious, <0.8 = very serious).
Dropouts at 6 months	128 (3 RCTs) follow-up: mean 6 months	⊕◯◯◯ Very low[c,q]	RR 1.12 (0.41 to 3.11)	98 per 1,000	**12 more per 1,000** (58 fewer to 208 more)	MID (precision) = RR 0.80 – 1.25.

a. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

b. Downgraded by 1 or 2 increments because heterogeneity, unexplained by subgroup analysis.

c. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs

d. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to deviations from the intended interventions and bias due to missing outcome data)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with control (including usual care, sham therapy and no treatment)	Risk difference with mirror therapy	

e. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to deviations from the intended interventions, bias due to missing outcome data, bias in measurement of the outcome and bias in selection of the reported result)

f. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias arising from the randomisation process)

g. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to missing outcome data and bias in selection of the reported result)

h. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviations from the intended interventions and bias due to missing outcome data)

i. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to deviations from the intended interventions)

j. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias due to deviations from the intended interventions and bias due to missing outcome data)

k. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to deviations from the intended interventions)

l. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process, bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

m. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

n. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to deviations from the intended interventions)

o. Downgraded by 1 to 2 increments for imprecision due to zero events and small sample size

p. Absolute effect calculated by risk difference due to zero events in at least one arm of one study

q. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to missing outcome data)

1.1.7 Economic evidence

1.1.7.1 Included studies

No health economic studies were included in this review.

1.1.7.2 Excluded studies

No relevant health economic studies were excluded due to assessment of limited applicability or methodological limitations.

See also the health economic study selection flow chart in Appendix G.

1.1.8 Summary of included economic evidence

No health economic studies were included.

1.1.9 Economic model

1.1.10 Unit costs

The main additional resource use of mirror therapy is the cost of the mirror. In the studies included in the clinical review this varied (see Table 1 for details) depending on whether a standard mirror was used versus a more costly mirror box. Although there would be an investment upfront of purchasing the mirror/mirror box, the cost per use would be negligible given that the mirror could be used for multiple people, doesn't require maintenance costs and would only need to be replaced if broken. Three out of the ninety-nine studies included in the clinical review (Mekbib 2021[74], In 2012[44], In 2016[43]) used virtual reality with a device capable of mirror therapy interventions; this would be costlier than conventional mirror therapy.

Mirror therapy interventions are supervised by an occupational or physiotherapist. However, in the majority of the studies included in the clinical review the time required did not vary between the mirror therapy and conventional therapy groups as mirror therapy was done instead of a different physical activity. In some instances, mirror therapy added more intervention time and in these cases there would be additional staff time costs. A small number of studies included other interventions being given with mirror therapy (such as neuromuscular electrical stimulation and transcranial electrical stimulation) which would also be an additional cost.

1.1.11 Evidence statements

Effectiveness/Qualitative

Economic

No relevant economic evaluations were identified.

1.1.12 The committee's discussion and interpretation of the evidence

1.1.12.1. The outcomes that matter most

The committee included the following outcomes: person/participant and carer generic health-related quality of life, upper limb and hand motor function, lower limb motor function, global motor function, Fugl-Meyer assessment upper extremity, measures of motor impairment for either the upper or lower limb, activities of daily living, pain, visuospatial neglect, stroke-

specific patient-reported outcome measures (including stroke-specific quality of life measures), adverse events and drop out rate.

All outcomes were considered equally important for decision making and therefore have all been rated as critical. This review updated a published Cochrane review (Theime 2018). Therefore, the outcomes used in this review are the same as those reported in the Cochrane review with the inclusion of three additional outcomes which were agreed by the guideline committee. Person/participant and carer generic health-related quality of life outcomes were added to this review as they are important for understand the holistic experience of people during and after the study. Similarly, stroke-specific Patient-Reported Outcome Measures were added as these provide insight into how the interventions affect the person's functional abilities and quality of life.

The committee chose to investigate these outcomes at the post-intervention follow-up time point and after 6 months. It was in line with the Cochrane review and allowed the committee to differentiate between any short-term changes or long-term effects of mirror therapy.

There was a large amount of evidence available for many of the outcomes at the post-intervention follow-up, with the number of studies reporting each outcome ranging from 2 to 65. Evidence was less frequently available for participant health-related quality of life, visuospatial neglect and adverse events. There was also less evidence available for the post 6-month follow-up period with studies per outcome ranging from 1 to 4. However, there was evidence available for all outcomes measures.

1.1.12.2 The quality of the evidence

Ninety-four randomised controlled trials were included in the review with 4 crossover RCTs (in which only the first phase was analysed as a parallel trial). Evidence was available for mirror therapy versus a placebo/sham, usual care or no treatment at post-intervention and after 6-month follow-up periods. Results comparing mirror therapy to any of these were pooled together for the analysis as this was the method employed by the Cochrane review.

The evidence varied from moderate to very low quality, with the majority being of very low quality. Outcomes were commonly downgraded for risk of bias, inconsistency and imprecision due to uncertainty around the effect estimate.

Inconsistency was present in many of the outcomes which was possibly due to the heterogenous nature of included studies. Heterogeneity was investigated with the pre-specified subgroups. However, none of the subgroups resolved the heterogeneity so these outcomes were downgraded for inconsistency and a random effects model was used in the analysis.

Risk of bias was rated high or very high in the majority of the studies. This was generally due to selection bias and inadequate allocation concealment along with lack of blinding of the patients, care providers or outcomes assessors. Although some studies attempted to blind patients using a form of sham mirror therapy, in most cases it was deemed inadequate to fully blind the patients to their treatment allocation. Combined with the subjective nature of many of the outcomes, this created a high risk of bias.

Imprecision was seen in a number of outcomes due to small sample sizes and uncertainty around the effect estimate.

The inclusion of 3 studies (Cacchio 2009a, Cacchio 2009b and Saha 2020) was debated by the committee as they included an indirect population of patients with complex regional pain syndrome and shoulder-hand syndrome. The committee noted that this is a rare condition found in a very specific stroke population and acknowledged its limited applicability to the general post-stroke population. The committee made a decision to keep these studies in the

analyses but to consider their influence on the overall effect estimate when making decisions. The studies were marked down for indirectness.

The committee concluded that the evidence was of a sufficient quality to make recommendations. They acknowledged the very low quality rating of the evidence, however, this was in part due to small study populations and balanced by the large amount of studies reporting many of the outcomes which provided increased confidence around the effect estimate. They noted that studies took place in a wide range of countries which in some cases may limit applicability to the NHS. However, 1 study was completed in the UK which implemented a mirror therapy intervention 7 days per week for 30 minute sessions, supervised initially and then moving to unsupervised. The committee believed this approach could be applied to an NHS setting.

1.1.12.3 Benefits and harms

1.1.12.3.1 Key uncertainties

The committee noted that, while there was a large amount of evidence available for mirror therapy in general, there was a lack of evidence detailing which specific patient groups would benefit. All the included studies reported a range of inclusion criteria and clinical presentations, hence the committee made a research recommendation for further evidence examining which patient groups would benefit most from mirror therapy.

In most of the included studies mirror therapy was supervised in an inpatient setting. However, the committee noted that more recently in the current NHS setting (particularly in regard to the COVID-19 pandemic) fewer people are being admitted to hospital and more care is being provided in the community and remotely. Given the intervention was mostly being delivered under supervision, the committee were uncertain if these benefits would be similar if unsupervised. However, the committee considered 1 study (Tyson 2015) which was conducted in the UK and included both supervised and unsupervised sessions. Mirror therapy was initiated in an inpatient setting and participants were provided with initial supervision and an instruction booklet then encouraged to practice unsupervised. Results showed small improvements in upper limb motor function and motor impairment. Due to this the committee concluded that benefits from mirror therapy would likely be seen if healthcare professionals educate people after stroke on how to complete mirror therapy during supervised sessions and then more regular practice took place without supervision.

1.1.12.3.2 Mirror therapy compared to all interventions

The results showed that, when compared to usual care, placebo and no treatment, there were clinically important benefits of mirror therapy at the end of intervention in upper limb and hand motor function and lower limb motor function. Clinically important benefits of mirror therapy were seen at 6 months in upper limb and hand motor function, activities of daily living, pain and visuospatial neglect.

An unclear effect was seen for some outcomes, where some outcomes showed a clinically important benefit and others showed no clinically important difference. This was the case at the end of intervention for Fugl-Meyer Assessment Upper Extremity, measures of motor impairment and stroke-specific Patient-Reported Outcome Measures. Similarly, an unclear effect was seen at 6 months in measures of motor impairment.

No clinically important difference was seen at the end of follow intervention in person/participant generic health-related quality of life, visuospatial neglect, adverse events and dropouts. No clinically important difference was seen at 6 months in adverse events and dropouts. A clinically important harm of mirror therapy was seen in person/participant generic health-related quality of life at 6 months.

The committee considered the outcomes for activities of daily living and visuospatial neglect that did not show clinically important differences. When examined further they agreed that these outcomes included outlier studies that had differences in baseline values. The committee considered that this may mask treatment effects and affect the overall effect sizes. Hence, the committee concluded that if these had been similar to the overall effect estimate, they may have reached the threshold for a clinically important benefit of mirror therapy.

The evidence also showed a clinically important benefit of reducing pain. However, 3 studies included in this outcome consisted of people with complex regional pain syndrome and shoulder-hand syndrome. These studies had a significant impact on the overall effect estimate. Therefore, the committee did not give the pain outcome as much weight when making recommendations as they agreed that changes in pain in this population may not be applicable to the general stroke population.

The committee considered the effect on quality of life seen at 6 months, which showed that mirror therapy was less effective than the control group. This outcome was reported on the EQ-5D scale. The committee considered the population included in this study which was a chronic population of on average 3.9 years post-stroke. The committee agreed that mirror therapy would probably not be as effective in this population due to the length of time post-stroke and reduction in the potential for neuroplastic changes over time after injury (for example, after the formation of glial scarring around an infarct site). They theorised that perhaps the introducing of a new and more complex intervention at the late stage in the person's rehabilitation (as opposed to a more traditional exercise-based intervention given to the controls) could disrupt their established coping mechanisms and possibly explain the lower EQ-5D result in the intervention group. The committee also noted that this finding came from 1 small study with only 32 participants so took this into account in their decision making.

There was no clinically important difference seen in the Fugl-Meyer Assessment upper extremity or dropout rate at the after 6-month follow-up. There was no evidence available for lower limb motor function and stroke-specific Patient-Reported Outcome Measures. No adverse events were reported in any of the studies.

The committee considered the poor quality of available evidence when making their decisions. However, they concluded that due to improvements in activities of daily living and visuospatial neglect balanced by the one negative outcome for person/participant health-related quality of life, that mirror therapy should be recommended.

The committee highlighted the improvement in activities of daily living at 6 month post-intervention as a particularly important finding. This was echoed by the experiences of a lay members in the committee who had received mirror therapy and reported that the main improvement was in upper limb motor function and ultimately activities of daily living involving dexterity or gripping tasks.

Ultimately, weighing up the benefits seen in the evidence with limited evidence of harm, the committee concluded that there was evidence that mirror therapy could be an effective therapy for rehabilitation after stroke. Therefore, they recommended that mirror therapy should be considered as a part of rehabilitation of the upper or lower limbs and that, if provided, it should be started within the first 6 months after a stroke with sessions at least 5 times a week over 4 weeks. They recommended that this should be supervised initially and for as long as necessary but considered that some people could participate without supervision.

1.1.12.4 Cost effectiveness and resource use

No relevant health economic analyses were identified for this review.

The majority of the interventions reported in the clinical review were supervised by either an occupational or physiotherapist. In many of these trials the main additional resource use of mirror therapy was the mirror or (more costly) mirror box, and the therapist time required to provide mirror therapy did not vary compared to the comparator therapy, as the same therapy was often given to both groups with the addition of the mirror being the only difference in treatment for the intervention group. The cost per use for a mirror would be very low given that the mirror could be used for multiple people, does not require maintenance costs and would only need to be replaced if broken. More significant resource use requirements were seen in studies that reported delivering mirror therapy in addition to usual care as this required additional therapist time.

Four out of the 99 studies included in the clinical review used virtual reality with a device capable of mirror therapy interventions, while a small number included other interventions given in conjunction with mirror therapy (such as neuromuscular electrical stimulation and transcranial electrical stimulation). Such interventions would incur additional costs for the NHS but given that they are mentioned in a small fraction of the studies the committee did not consider these options further.

The committee considered the poor quality of available clinical evidence for mirror therapy interventions. While the committee acknowledged that one negative outcome was reported for person/participant health-related quality of life, they were encouraged by evidence suggesting an improvement in activities of daily living and visuospatial neglect. Such clinical benefits reflected their own experiences, with lay members highlighting the value of mirror therapy in improving upper limb motor function and ultimately activities of daily living involving dexterity or gripping tasks.

The committee agreed that mirror therapy interventions are available in some NHS settings but are not used as part of routine practice for stroke rehabilitation. In instances where mirror therapy is available, initial supervision is administered by an occupational or physiotherapist for only a few sessions before it is offered to people as a take-home intervention, where a mirror/mirror box is loaned to people to engage in independent practice. The committee acknowledged that while some people may need more supervision, such as those with cognitive difficulties, most people are expected to perform mirror therapy unsupervised after initial training, both in hospital and at home.

The committee suggested that sessions could be held for around 30 minutes, 5 days per week for at least 4 weeks, as this was the average length and frequency reported in the included studies. However, the variation in the duration and frequency of the interventions in the clinical review meant that they were unsure of the additional staff time that would be required to provide the initial supervision for mirror therapy. The committee could also not confirm what proportion of the stroke population would be offered this service due to the heterogenous population comprised in the clinical trials. This creates uncertainty for the potential resource impact this would create for the NHS.

Despite these concerns, the low equipment costs and expectation for most people to perform mirror therapy unsupervised following initial training, paired with the clinical benefits to activities of daily living led the committee to view mirror therapy as a potentially cost-effective intervention for post-stroke rehabilitation. However, given the insufficient quality of available clinical evidence and lack of economic evidence, the committee proposed a ‘consider’ recommendation.

1.1.12.5 Other factors the committee took into account

The committee considered the frequency and intensity of mirror therapy interventions. They discussed the benefits of tailoring the length and frequency of the sessions to the needs of the individual in order to promote patient empowerment rather than recommending a set ‘dose’ of treatment. The committee suggested that breaking up practice into smaller sessions

may be particularly important for people with post-stroke fatigue or difficulties with attention and concentration. On the contrary, some members of the committee suggested it was preferable to recommend set ‘doses’ of treatment as this gives a target and makes it easier to monitor if sessions are being delivered. Hence the committee recommended the frequency of 5 days per week for at least 4 weeks as this was representative but noted that this should be tailored to fit the needs of the person (refer to the review on intensity of rehabilitation for further guidance about delivering intense therapy).

The committee recognised that the need for supervised sessions will vary between people after stroke. Whilst they agreed that many will be able to practice mirror therapy unsupervised after initial instruction and education, they noted that others will require ongoing supervision. This could include people with cognitive difficulties or those requiring assistance with positioning to be able to engage in the sessions. The committee noted that sessions could be supervised by anyone in the rehabilitation team (including occupational therapists, physiotherapists and rehabilitation assistants) who has the appropriate training. Support for these sessions could be gained through collaboration with third sector organisations. After discharge, family, friends and carers could be educated on how to supervise these sessions.

1.1.13 Recommendations supported by this evidence review

This evidence review supports recommendations 1.13.30 and 1.13.31 and the research recommendation on groups that benefit from mirror therapy in Appendix K.

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Appendices

Appendix A – Review protocols

Review protocol for the clinical and cost-effectiveness of mirror therapy after a stroke

ID	Field	Content
0.	PROSPERO registration number	CRD42021248529
1.	Review title	In people after stroke, what is the clinical and cost effectiveness of mirror therapy to improve motor function, visuospatial function and activities of daily living?
2.	Review question	4.11 In people after stroke, what is the clinical and cost effectiveness of mirror therapy to improve motor function, visuospatial function and activities of daily living?
3.	Objective	To determine the clinical and cost-effectiveness of mirror therapy in improving motor and visuospatial function and activities of daily living for people after a stroke.
4.	Searches	Key paper: Thieme H, Morkisch N, Mehrholz J, Pohl M, Behrens J, Borgetto B, Dohle C. Mirror therapy for improving motor function after stroke. Cochrane Database of Systematic Reviews 2018, Issue 7. Art. No.: CD008449. DOI: 10.1002/14651858.CD008449.pub3. The following databases (from inception) will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • PEDRO Searches will be restricted by: • Date limitations – August 2017 onwards ○ This review is an update of an existing Cochrane review. Therefore, the search will be conducted from the time when the Cochrane review search finished. • English language studies • Human studies

		Other searches: • Inclusion lists of systematic reviews The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review. Medline search strategy to be quality assured using the PRESS evidence-based checklist (see methods chapter for full details).
5.	Condition or domain being studied	Adults and young people (16 or older) after a stroke
6.	Population	Inclusion: • Adults (age ≥16 years) who have had a first or recurrent stroke (including people who had a stroke caused by a subarachnoid haemorrhage) Exclusion: • Children (age <16 years) • People after a transient ischaemic attack
7.	Intervention	• Mirror therapy (using a mirror to create a reflection of the non-paretic upper or lower limb to give visual feedback of normal movement). Can include o Conventional mirror therapy o 'Mirror like' therapies of video or computer graphic interventions If studies combined mirror therapy and another intervention they included it if at least 50% of the time was spent focused on mirror therapy.
8.	Comparator	• Sham therapy/placebo • Usual care • No treatment
9.	Types of study to be included	• Systematic reviews of RCTs • Parallel RCTs • Crossover RCTs – only the first period of any crossover RCT will be included (to match parallel trials) If insufficient RCT evidence is available, non-randomised studies will be considered, including: 3. Prospective and retrospective cohort studies

		4. Case control trials (if there are no cohort studies) Published NMAs and IPDs will be considered for inclusion.
10.	Other exclusion criteria	• Non-English language studies • Non comparative cohort studies • Before and after studies • Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available.
11.	Context	People with a reduction in limb function after a stroke. This may include people in an acute (<7 days), subacute (7 days – 6 months) or chronic (>6 months) time horizon.

12.	Primary outcomes (critical outcomes)	All outcomes are considered equally important for decision making and therefore have all been rated as critical:
		
		At time period:
		• End of the intervention
		• >6 months (if a study reports outcomes after the end of intervention but at ≤6 months then it will not be included in this category)
		
		• Person/participant generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
		  ○ EQ-5D
		  ○ SF-6D
		  ○ SF-36
		  ○ SF-12
		  ○ Other utility measures (AQOL, HUI, 15D, QWB)
		• Carer generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
		  ○ EQ-5D
		  ○ SF-6D
		  ○ SF-36
		  ○ SF-12
		  ○ Other utility measures (AQOL, HUI, 15D, QWB)
		• Upper limb and hand motor function (continuous outcomes will be prioritised)
		  ○ Action Research Arm Test
		  ○ Wolf Motor Function Test
		  ○ Motor Assessment Scale – Upper limb and hand function or both

		○ Manual Function Test ○ Box and Block Test • Lower limb motor function (continuous outcomes will be prioritised) ○ Motor Assessment Scale – Items 4 or 5 (or both) ○ Berg Balance Scale • Global motor function (continuous outcomes will be prioritised) ○ Motor Assessment Scale ○ Rivermead Motor Assessment Scale • Fugl-Meyer Assessment Upper Extremity (continuous outcomes will be prioritised) • Measures of motor impairment (continuous outcomes will be prioritised) ○ Upper limb – Brunnstrom Stages of the Upper Extremity – Motricity Index – Arm score – Muscle or grip strength ○ Lower limb – Fugl-Meyer Assessment Lower Extremity – Brunnstrom Stages of the Lower Extremity • Activities of daily living (continuous outcomes will be prioritised) ○ Functional Independence Measure ○ Barthel Index • Pain (continuous outcomes will be prioritised) ○ Visual analogue scale ○ Numeric rating scale • Visuospatial neglect (continuous outcomes will be prioritised) ○ Star cancellation • Stroke-specific Patient-Reported Outcome Measures (continuous outcomes will be prioritised) ○ Stroke-Specific Quality of Life (SS-QOL) ○ Stroke Impact Scale (SIS) ○ Stroke-specific Sickness Impact Profile (SA-SIP30) ○ Satisfaction with International Classification of Functioning, Disability and Health – Stroke (SATIS-Stroke) ○ Neuro-QOL? ○ PROMIS-10? • Adverse events (dichotomous outcome) • Dropout rate (dichotomous outcome)

14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4). 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary. Study investigators may be contacted for missing data where time and resources allow.
15.	Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. • Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) • Non randomised study, including cohort studies: Cochrane ROBINS-I • Case control study: CASP case control checklist
16.	Strategy for data synthesis	• Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). Fixed-effects (Mantel-Haenszel) techniques will be used to calculate risk ratios for the binary outcomes where possible. Continuous outcomes will be analysed using an inverse variance method for pooling weighted mean differences. Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic and visually inspected. An I^2 value greater than

		50% will be considered indicative of substantial heterogeneity. Sensitivity analyses will be conducted based on pre-specified subgroups using stratified meta-analysis to explore the heterogeneity in effect estimates. If this does not explain the heterogeneity, the results will be presented pooled using random-effects. • GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ • Where meta-analysis is not possible, data will be presented and quality assessed individually per outcome. • WinBUGS will be used for network meta-analysis, if possible given the data identified.
17.	Analysis of sub-groups	Subgroups that will be investigated if heterogeneity is present: Acute/subacute or chronic stroke • Acute/Subacute (<6 months) • Chronic (>6 months) Level of supervision • Supervised • Unsupervised Severity (as stated by category or as measured by NIHSS scale): • Mild (or NIHSS 1-5) • Moderate (or NIHSS 5-14) • Severe (or NIHSS 15-24) • Very severe (or NIHSS >25) Type of stroke (using the Bamford scale): • Total anterior circulation stroke (TACS) • Partial anterior circulation stroke (PACS) • Lacunar stroke (LACS) • Posterior circulation stroke (POCS)

<table>
<tr><td></td><td></td><td colspan="3">Limb therapy is used for:
• Upper extremity
• Lower extremity</td></tr>
<tr><td rowspan="8">18.</td><td rowspan="8">Type and method of review</td><td>☒</td><td colspan="2">Intervention</td></tr>
<tr><td>☐</td><td colspan="2">Diagnostic</td></tr>
<tr><td>☐</td><td colspan="2">Prognostic</td></tr>
<tr><td>☐</td><td colspan="2">Qualitative</td></tr>
<tr><td>☐</td><td colspan="2">Epidemiologic</td></tr>
<tr><td>☐</td><td colspan="2">Service Delivery</td></tr>
<tr><td>☐</td><td colspan="2">Other (please specify)</td></tr>
<tr><td></td><td></td><td colspan="3"></td></tr>
<tr><td>19.</td><td>Language</td><td colspan="3">English</td></tr>
<tr><td>20.</td><td>Country</td><td colspan="3">England</td></tr>
<tr><td>21.</td><td>Anticipated or actual start date</td><td colspan="3">24/02/2021</td></tr>
<tr><td>22.</td><td>Anticipated completion date</td><td colspan="3">14/12/2022</td></tr>
<tr><td rowspan="8">23.</td><td rowspan="8">Stage of review at time of this submission</td><td>Review stage</td><td>Started</td><td>Completed</td></tr>
<tr><td>Preliminary searches</td><td>☐</td><td>☐</td></tr>
<tr><td>Piloting of the study selection process</td><td>☐</td><td>☐</td></tr>
<tr><td>Formal screening of search results against eligibility criteria</td><td>☐</td><td>☐</td></tr>
<tr><td>Data extraction</td><td>☐</td><td>☐</td></tr>
<tr><td>Risk of bias (quality) assessment</td><td>☐</td><td>☐</td></tr>
<tr><td>Data analysis</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td colspan="3"></td></tr>
<tr><td>24.</td><td>Named contact</td><td colspan="3">5a. Named contact
National Guideline Centre

5b Named contact e-mail
StrokeRehabUpdate@nice.nhs.uk

5e Organisational affiliation of the review
National Institute for Health and Care Excellence (NICE) and National Guideline Centre</td></tr>
</table>

25.	Review team members	From the National Guideline Centre: Bernard Higgins (Guideline lead) George Wood (Senior systematic reviewer) Madelaine Zucker (Systematic reviewer) Kate Lovibond (Health economics lead) Claire Sloan (Health economist) Joseph Runicles (Information specialist) Nancy Pursey (Senior project manager)
26.	Funding sources/sponsor	This systematic review is being completed by the National Guideline Centre which receives funding from NICE.
27.	Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10175
29.	Other registration details	N/A
30.	Reference/URL for published protocol	N/A
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.

32.	Keywords	Adults; Intervention; Mirror therapy; Rehabilitation; Stroke; Visuospatial	
33.	Details of existing review of same topic by same authors	N/A	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☒	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	N/A	
36.	Details of final publication	www.nice.org.uk	

Health economic review protocol

Review question	All questions – health economic evidence
Objectives	To identify health economic studies relevant to any of the review questions.
Search criteria	• Populations, interventions and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.
Search strategy	A health economic study search will be undertaken using population-specific terms and a health economic study filter – see appendix B below. Databases searched: • Centre for Reviews and Dissemination NHS Economic Evaluations Database (NHS EED) – all years (closed to new records April 2015) • Centre for Reviews and Dissemination Health Technology Assessment database – all years (closed to new records March 2018) • International HTA database (INAHTA) – all years • Medline and Embase – from 2014 (due to NHS EED closure)
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2006 (including those included in the previous guideline), abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual (2014).[79] Studies published in 2006 or later that were included in the previous guideline will be reassessed for inclusion and may be included or selectively excluded based on their relevance to the questions covered in this update and whether more applicable evidence is also identified. **Inclusion and exclusion criteria** • If a study is rated as both 'Directly applicable' and with 'Minor limitations' then it will be included in the guideline. A health economic evidence table will be completed and it will be included in the health economic evidence profile. • If a study is rated as either 'Not applicable' or with 'Very serious limitations' then it will usually be excluded from the guideline. If it is excluded then a health economic evidence table will not be completed and it will not be included in the health economic evidence profile. • If a study is rated as 'Partially applicable', with 'Potentially serious limitations' or both then there is discretion over whether it should be included. **Where there is discretion** The health economist will make a decision based on the relative applicability and quality of the available evidence for that question, in discussion with the

guideline committee if required. The ultimate aim is to include health economic studies that are helpful for decision-making in the context of the guideline and the current NHS setting. If several studies are considered of sufficiently high applicability and methodological quality that they could all be included, then the health economist, in discussion with the committee if required, may decide to include only the most applicable studies and to selectively exclude the remaining studies. All studies excluded on the basis of applicability or methodological limitations will be listed with explanation in the excluded health economic studies appendix below.

The health economist will be guided by the following hierarchies.

Setting:

- UK NHS (most applicable).
- OECD countries with predominantly public health insurance systems (for example, France, Germany, Sweden).
- OECD countries with predominantly private health insurance systems (for example, Switzerland).
- Studies set in non-OECD countries or in the USA will be excluded before being assessed for applicability and methodological limitations.

Health economic study type:

- Cost–utility analysis (most applicable).
- Other type of full economic evaluation (cost–benefit analysis, cost-effectiveness analysis, cost–consequences analysis).
- Comparative cost analysis.
- Non-comparative cost analyses including cost-of-illness studies will be excluded before being assessed for applicability and methodological limitations.

Year of analysis:

- The more recent the study, the more applicable it will be.
- Studies published in 2006 or later (including any such studies included in the previous guideline) but that depend on unit costs and resource data entirely or predominantly from before 2006 will be rated as ‘Not applicable’.
- Studies published before 2006 (including any such studies included in the previous guideline) will be excluded before being assessed for applicability and methodological limitations.

Quality and relevance of effectiveness data used in the health economic analysis:

- The more closely the clinical effectiveness data used in the health economic analysis match with the outcomes of the studies included in the clinical review the more useful the analysis will be for decision-making in the guideline.

Appendix B – Literature search strategies

B.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies as these concepts may not be indexed or described in the title or abstract and are therefore difficult to retrieve. Search filters were applied to the search where appropriate.

Table 4: Database parameters, filters and limits applied

Database	Dates searched	Search filter used
Medline (OVID)	01 September 2017 – 08 January 2023	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	01 September 2017 – 08 January 2023	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts) English language
The Cochrane Library (Wiley)	Cochrane Reviews 2017 to 2023 Issue 1 of 12 CENTRAL 2017 to 2023 Issue 1 of 12	Exclusions (clinical trials, conference abstracts)
AMED, Allied and Complementary Medicine (OVID)	01 September 2017 – 08 January 2023	Exclusions (animal studies, letters, comments, case reports) English language
PsycINFO (OVID)	01 September 2017 – 08 January 2023	Exclusions (animal studies, letters, case reports) Human English language
PEDro (Physiotherapy Evidence Database)	01 September 2017 – 08 January 2023	English language

Medline (Ovid) search terms

1.	exp Stroke/
2.	Stroke Rehabilitation/
3.	exp Cerebral Hemorrhage/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
6.	"brain attack*".ti,ab.
7.	or/1-6
8.	letter/
9.	editorial/
10.	news/
11.	exp historical article/
12.	Anecdotes as Topic/
13.	comment/
14.	case report/
15.	(letter or comment*).ti.
16.	or/8-15
17.	randomized controlled trial/ or random*.ti,ab.
18.	16 not 17
19.	animals/ not humans/
20.	exp Animals, Laboratory/
21.	exp Animal Experimentation/
22.	exp Models, Animal/
23.	exp Rodentia/
24.	(rat or rats or mouse or mice or rodent*).ti.
25.	or/18-24
26.	7 not 25
27.	limit 26 to English language
28.	Illusions/
29.	(mirror* or visual* or virtual*).ti,ab.
30.	(computer adj5 (reflection or illusion or feedback or therapy)).ti,ab.
31.	(reflect or reflection* or illusion*).ti,ab.
32.	or/28-31
33.	randomized controlled trial.pt.
34.	controlled clinical trial.pt.
35.	randomi#ed.ti,ab.
36.	placebo.ab.
37.	randomly.ti,ab.
38.	Clinical Trials as topic.sh.
39.	trial.ti.
40.	or/33-39
41.	Meta-Analysis/
42.	exp Meta-Analysis as Topic/

43.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
44.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
45.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
46.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
47.	(search* adj4 literature).ab.
48.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
49.	cochrane.jw.
50.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
51.	or/41-50
52.	40 or 51
53.	27 and 32
54.	52 and 53

Embase (Ovid) search terms

1.	exp Cerebrovascular accident/
2.	exp Brain infarction/
3.	Stroke Rehabilitation/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
6.	"brain attack*".ti,ab.
7.	Intracerebral hemorrhage/
8.	or/1-7
9.	letter.pt. or letter/
10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	(conference abstract or conference paper).pt.
15.	or/9-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animal/ not human/
19.	nonhuman/
20.	exp Animal Experiment/
21.	exp Experimental Animal/
22.	animal model/
23.	exp Rodent/
24.	(rat or rats or mouse or mice).ti.
25.	or/17-24
26.	8 not 25
27.	limit 26 to English language
28.	illusion/

29.	(mirror* or visual* or virtual*).ti,ab.
30.	(computer adj5 (reflection or illusion or feedback or therapy)).ti,ab.
31.	(reflect or reflection* or illusion*).ti,ab.
32.	or/28-31
33.	random*.ti,ab.
34.	factorial*.ti,ab.
35.	(crossover* or cross over*).ti,ab.
36.	((doubl* or singl*) adj blind*).ti,ab.
37.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
38.	crossover procedure/
39.	single blind procedure/
40.	randomized controlled trial/
41.	double blind procedure/
42.	or/33-41
43.	systematic review/
44.	meta-analysis/
45.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
46.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
47.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
48.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
49.	(search* adj4 literature).ab.
50.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
51.	cochrane.jw.
52.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
53.	or/43-52
54.	42 or 53
55.	27 and 32
56.	54 and 55

Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Stroke] explode all trees
#2.	MeSH descriptor: [Stroke Rehabilitation] explode all trees
#3.	MeSH descriptor: [Cerebral Hemorrhage] explode all trees
#4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident"):ti,ab
#5.	((cerebro* or brain or brainstem or cerebral*) near/3 (infarct* or accident*)):ti,ab
#6.	brain attack*:ti,ab
#7.	(or #1-#6)
#8.	conference:pt or (clinicaltrials or trialsearch):so
#9.	#7 not #8
#10.	MeSH descriptor: [Illusions] explode all trees
#11.	(mirror* or visual* or virtual*):ti,ab
#12.	(computer near/5 (reflection or illusion or feedback or therapy)):ti,ab

#13.	(reflect or reflection* or illusion*):ti,ab
#14.	(or #10-#13)
#15.	#9 and #14

PEDro search terms

1.	Stroke and mirror therapy

PsycINFO search terms

1.	exp Stroke/
2.	exp Cerebral hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	Cerebrovascular accidents/
7.	exp Brain damage/
8.	(brain adj2 injur*).ti.
9.	or/1-8
10.	Letter/
11.	Case report/
12.	exp rodents/
13.	or/10-12
14.	9 not 13
15.	limit 14 to (human and English language)
16.	Illusions/
17.	(mirror* or visual* or virtual*).ti,ab.
18.	(computer adj5 (reflection or illusion or feedback or therapy)).ti,ab.
19.	(reflect or reflection* or illusion*).ti,ab.
20.	or/16-19
21.	15 and 20

AMED search terms

1.	exp Stroke/
2.	exp Cerebral Hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	or/1-5
7.	case report/
8.	(letter or comment*).ti.
9.	or/7-8
10.	randomized controlled trials/ or random*.ti,ab.
11.	9 not 10
12.	animals/ not humans/

13.	(rat or rats or mouse or mice or rodent*).ti.
14.	or/11-13
15.	6 not 14
16.	Limit 15 to English language
17.	perception/ or visual perception/
18.	(mirror* or visual* or virtual*).ti,ab.
19.	((limb* or arm* or leg) adj5 (mirror* or reflect* or reflection* or illusion* or visual* or virtual*)).ti,ab.
20.	Or/17-19
21.	16 and 20

B.2 Health Economics literature search strategy

Health economic evidence was identified by conducting searches using terms for a broad Stroke Rehabilitation population. The following databases were searched: NHS Economic Evaluation Database (NHS EED - this ceased to be updated after 31st March 2015), Health Technology Assessment database (HTA - this ceased to be updated from 31st March 2018) and The International Network of Agencies for Health Technology Assessment (INAHTA). Searches for recent evidence were run on Medline and Embase from 2014 onwards for health economics, and all years for quality-of-life studies. Additional searches were run in CINAHL and PsycInfo looking for health economic evidence.

Table 2: Database parameters, filters and limits applied

Database	Dates searched	Search filters and limits applied
Medline (OVID)	Health Economics 1 January 2014 – 08 January 2023	Health economics studies Quality of life studies Exclusions (animal studies, letters, comments, editorials, case studies/reports,) English language
	Quality of Life 1946 – 08 January 2023	
Embase (OVID)	Health Economics 1 January 2014 – 08 January 2023	Health economics studies Quality of life studies Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts) English language
	Quality of Life 1974 – 08 January 2023	
NHS Economic Evaluation Database (NHS EED) (Centre for Research and Dissemination - CRD)	Inception –31st March 2015	
Health Technology Assessment Database (HTA)	Inception – 31st March 2018	

Database	Dates searched	Search filters and limits applied
(Centre for Research and Dissemination – CRD)		
The International Network of Agencies for Health Technology Assessment (INAHTA)	Inception - 08 January 2023	English language
PsycINFO (OVID)	1 January 2014 – 08 January 2023	Health economics studies Exclusions (animal studies, letters, case reports) Human English language
Current Nursing and Allied Health Literature - CINAHL (EBSCO)	1 January 2014 – 08 January 2023	Health economics studies Exclusions (Medline records, animal studies, letters, editorials, comments, theses) Human English language

Medline (Ovid) search terms

1.	exp Stroke/
2.	exp Cerebral Hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	or/1-5
7.	letter/
8.	editorial/
9.	news/
10.	exp historical article/
11.	Anecdotes as Topic/
12.	comment/
13.	case report/
14.	(letter or comment*).ti.
15.	or/7-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animals/ not humans/
19.	exp Animals, Laboratory/

20.	exp Animal Experimentation/
21.	exp Models, Animal/
22.	exp Rodentia/
23.	(rat or rats or mouse or mice or rodent*).ti.
24.	or/17-23
25.	6 not 24
26.	Economics/
27.	Value of life/
28.	exp "Costs and Cost Analysis"/
29.	exp Economics, Hospital/
30.	exp Economics, Medical/
31.	Economics, Nursing/
32.	Economics, Pharmaceutical/
33.	exp "Fees and Charges"/
34.	exp Budgets/
35.	budget*.ti,ab.
36.	cost*.ti.
37.	(economic* or pharmaco?economic*).ti.
38.	(price* or pricing*).ti,ab.
39.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
40.	(financ* or fee or fees).ti,ab.
41.	(value adj2 (money or monetary)).ti,ab.
42.	or/26-41
43.	quality-adjusted life years/
44.	sickness impact profile/
45.	(quality adj2 (wellbeing or well being)).ti,ab.
46.	sickness impact profile.ti,ab.
47.	disability adjusted life.ti,ab.
48.	(qal* or qtime* or qwb* or daly*).ti,ab.
49.	(euroqol* or eq5d* or eq 5*).ti,ab.
50.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
51.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
52.	(hui or hui1 or hui2 or hui3).ti,ab.
53.	(health* year* equivalent* or hye or hyes).ti,ab.
54.	discrete choice*.ti,ab.
55.	rosser.ti,ab.
56.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
57.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
58.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.

59.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
60.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
61.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
62.	or/43-61
63.	25 and 42
64.	25 and 62
65.	limit 63 to English language
66.	limit 64 to English language

Embase (Ovid) search terms

1.	exp Cerebrovascular accident/
2.	exp Brain infarction/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	Intracerebral hemorrhage/
7.	or/1-6
8.	letter.pt. or letter/
9.	note.pt.
10.	editorial.pt.
11.	case report/ or case study/
12.	(letter or comment*).ti.
13.	or/8-12
14.	randomized controlled trial/ or random*.ti,ab.
15.	13 not 14
16.	animal/ not human/
17.	nonhuman/
18.	exp Animal Experiment/
19.	exp Experimental Animal/
20.	animal model/
21.	exp Rodent/
22.	(rat or rats or mouse or mice).ti.
23.	or/15-22
24.	7 not 23
25.	health economics/
26.	exp economic evaluation/
27.	exp health care cost/
28.	exp fee/
29.	budget/
30.	funding/
31.	budget*.ti,ab.

32.	cost*.ti.
33.	(economic* or pharmaco?economic*).ti.
34.	(price* or pricing*).ti,ab.
35.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
36.	(financ* or fee or fees).ti,ab.
37.	(value adj2 (money or monetary)).ti,ab.
38.	or/25-37
39.	quality adjusted life year/
40.	"quality of life index"/
41.	short form 12/ or short form 20/ or short form 36/ or short form 8/
42.	sickness impact profile/
43.	(quality adj2 (wellbeing or well being)).ti,ab.
44.	sickness impact profile.ti,ab.
45.	disability adjusted life.ti,ab.
46.	(qal* or qtime* or qwb* or daly*).ti,ab.
47.	(euroqol* or eq5d* or eq 5*).ti,ab.
48.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
49.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
50.	(hui or hui1 or hui2 or hui3).ti,ab.
51.	(health* year* equivalent* or hye or hyes).ti,ab.
52.	discrete choice*.ti,ab.
53.	rosser.ti,ab.
54.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
55.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
56.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
57.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
58.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
59.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
60.	or/39-59
61.	limit 24 to English language
62.	38 and 61
63.	60 and 61

NHS EED and HTA (CRD) search terms

#1.	MeSH DESCRIPTOR Stroke EXPLODE ALL TREES
#2.	MeSH DESCRIPTOR Cerebral Hemorrhage EXPLODE ALL TREES
#3.	(stroke* or cva or poststroke* or apoplexy or "cerebrovascular accident")
#4.	(((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)))
#5.	("brain attack*")
#6.	#1 OR #2 OR #3 OR #4 OR #5

INAHTA search terms

1.	(brain attack*) OR (((cerebro* or brain or brainstem or cerebral*) and (infarct* or accident*))) OR ((stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident")) OR ("Cerebral Hemorrhage"[mhe]) OR ("Stroke"[mhe])

CINAHL search terms

1.	MH "Economics+"
2.	MH "Financial Management+"
3.	MH "Financial Support+"
4.	MH "Financing, Organized+"
5.	MH "Business+"
6.	S2 OR S3 or S4 OR S5
7.	S1 not S6
8.	MH "Health Resource Allocation"
9.	MH "Health Resource Utilization"
10.	S8 OR S9
11.	S7 OR S10
12.	(cost or costs or economic* or pharmacoeconomic* or price* or pricing*) OR AB (cost or costs or economic* or pharmacoeconomic* or price* or pricing*)
13.	S11 OR S12
14.	PT editorial
15.	PT letter
16.	PT commentary
17.	S14 or S15 or S16
18.	S13 NOT S17
19.	MH "Animal Studies"
20.	(ZT "doctoral dissertation") or (ZT "masters thesis")
21.	S18 NOT (S19 OR S20)
22.	PY 2014-
23.	S21 AND S22
24.	MW Stroke or MH Cerebral Hemorrhage
25.	stroke* or cva or poststroke* or apoplexy or "cerebrovascular accident"
26.	(cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)
27.	"brain attack*"
28.	S24 OR S25 OR S26 OR S27
29.	S23 AND S28

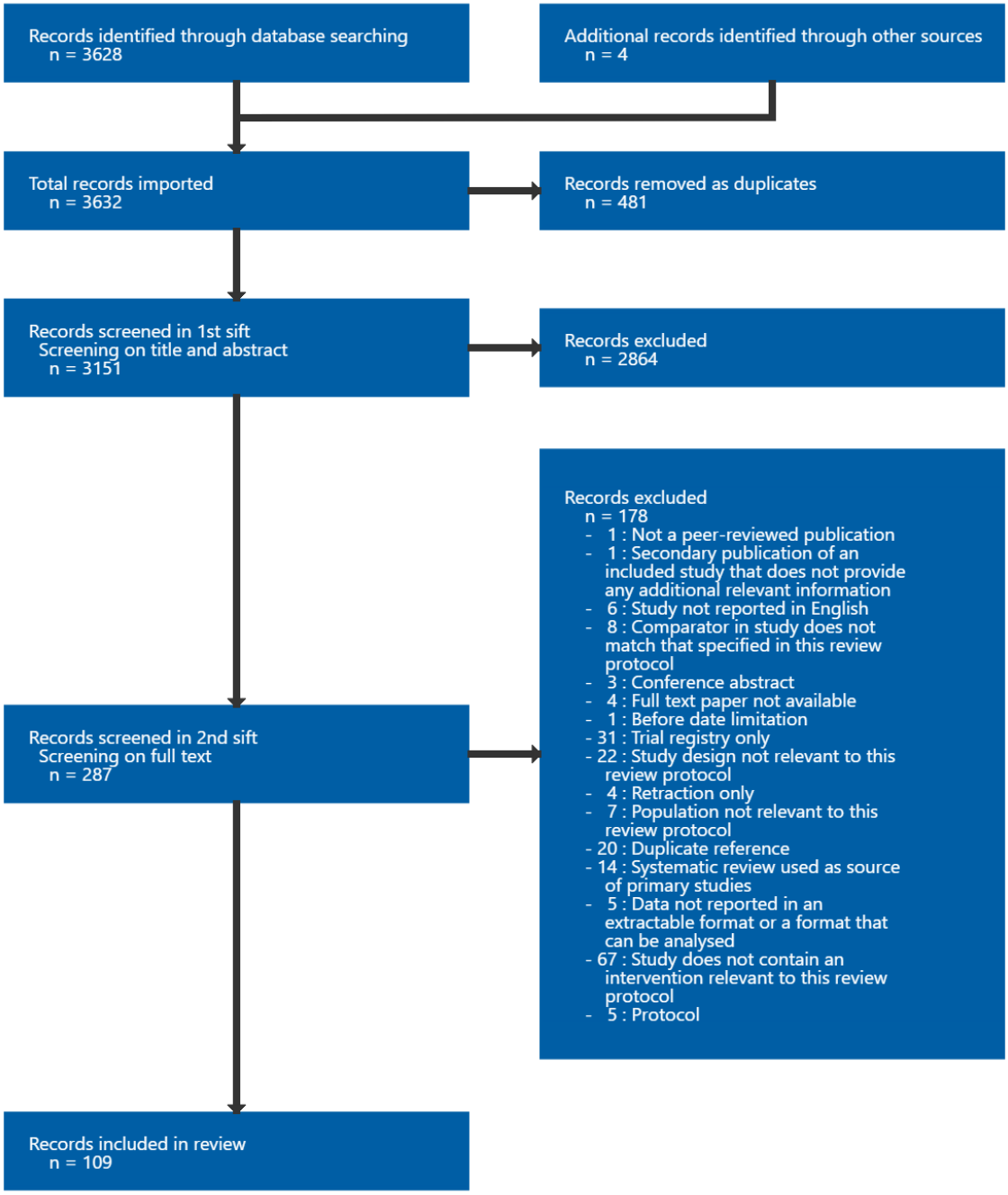
PsycINFO search terms

1.	exp Stroke/
2.	exp Cerebral hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	Cerebrovascular accidents/

7.	exp Brain damage/
8.	(brain adj2 injur*).ti.
9.	or/1-8
10.	Letter/
11.	Case report/
12.	exp Rodents/
13.	or/10-12
14.	9 not 13
15.	limit 14 to (human and english language)
16.	First posting.ps.
17.	15 and 16
18.	15 or 17
19	"costs and cost analysis"/
20.	"Cost Containment"/
21.	(economic adj2 evaluation$).ti,ab.
22.	(economic adj2 analy$).ti,ab.
23.	(economic adj2 (study or studies)).ti,ab.
24.	(cost adj2 evaluation$).ti,ab.
25.	(cost adj2 analy$).ti,ab.
26.	(cost adj2 (study or studies)).ti,ab.
27.	(cost adj2 effective$).ti,ab.
28.	(cost adj2 benefit$).ti,ab.
29.	(cost adj2 utili$).ti,ab.
30.	(cost adj2 minimi$).ti,ab.
31.	(cost adj2 consequence$).ti,ab.
32.	(cost adj2 comparison$).ti,ab.
33.	(cost adj2 identificat$).ti,ab.
34.	(pharmacoeconomic$ or pharmaco-economic$).ti,ab.
35.	or/19-34
36.	(0003-4819 or 0003-9926 or 0959-8146 or 0098-7484 or 0140-6736 or 0028-4793 or 1469-493X).is.
37.	35 not 36
38.	18 and 37

Appendix C – Effectiveness evidence study selection

Figure 1: Flow chart of clinical study selection for the review of the clinical and cost-effectiveness of mirror therapy



Appendix D – Effectiveness evidence

Acerra, 2007

Bibliographic Reference	Acerra, NE; Is early post-stroke upper limb mirror therapy associated with improved sensation & motor recovery? A randomised-controlled trial; Sensorimotor dysfunction in CRPS1 and stroke: characteristics, predicition and intervention. doctoral thesis, University of Queensland (Australia); 2007

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Australia.
Study setting	Inpatient.
Study dates	No additional information.
Sources of funding	Not stated.

Inclusion criteria	Acute stroke (<2 weeks).
Exclusion criteria	Previous stroke; vision or hearing impairment; acute trauma or impairment of the limbs; inability to sit supported in a high-backed chair for < 1 hour; MMSE < 22/30; major comorbidities.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy n=20 Participants were instructed to move both arms while looking in the mirror box, sensory stimulation. Concomitant therapy: Treatment 5 days a week, 20 to 30 minutes for 2 weeks with an additional usual rehabilitation programme.
Comparator	Sham therapy n=20 Participants performed the same treatment protocol as in group 1 but only viewing the unaffected arm. Concomitant therapy: Treatment 5 days a week, 20 to 30 minutes for 2 weeks with an additional usual rehabilitation programme.
Number of participants	40.
Duration of follow-up	1 month and 2 weeks (2 weeks of therapy, additional follow up for 1 month).
Additional comments	This study is a thesis. This was extracted from the Cochrane review with no additional information being extracted.

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information available.

Study arms

Mirror therapy (N = 20)

Participants were instructed to move both arms while looking in the mirror box, sensory stimulation

Sham therapy (N = 20)

Participants performed the same treatment protocol as in group 1 but only viewing the unaffected arm

Characteristics

Study-level characteristics

Characteristic	Study (N = 40)
% Female Sample size	n = 22 ; % = 55
Mean age (SD) Mean (SD)	68 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	40
Time period since stroke (days) See inclusion criteria Mean (SD)	5.3 (NR)
Left Nominal	16

Characteristic	Study (N = 40)
Right Nominal	24

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention (2 weeks) - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 2 week, N = 20	Sham therapy, Baseline, N = 20	Sham therapy, 2 week, N = 20
Motor function (Motor Assessment Scale) Item 7 only. Scale range: Each item 0-6. Mean (SD)	NR (NR)	3.7 (1.3)	NR (NR)	2.8 (1.3)
Motor impairment (grip strength) (kg) Handheld dynamometer Mean (SD)	NR (NR)	13.7 (5.8)	NR (NR)	9.6 (3.8)
Pain (NRS) Change score. Combined scores for pain intensity of shoulder and hand. Scale range: 0-10 Mean (SD)	NR (NR)	0.1 (0.3)	NR (NR)	0.6 (1.4)

Motor function (Motor Assessment Scale) - Polarity - Higher values are better

Motor impairment (grip strength) - Polarity - Higher values are better

Pain (NRS) - Polarity - Lower values are better

Mirror therapy compared to sham therapy at end of intervention (2 weeks) - dichotomous outcomes

Outcome	**Mirror therapy, Baseline, N = 20**	**Mirror therapy, 2 week, N = 20**	**Sham therapy, Baseline, N = 20**	**Sham therapy, 2 week, N = 20**
Dropouts Nominal	NR	0	NR	0
Adverse events Only reports in the Cochrane review that 'no adverse events were reported' when discussing any study Nominal	NR	0	NR	0

Dropouts - Polarity - Lower values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention(2weeks)-continuousoutcomes-Motorfunction(MotorAssessmentScale)-MeanSD-Mirror therapy-Sham therapy-t2

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(2weeks)-continuousoutcomes-Motorimpairment(gripstrength)-MeanSD-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(2weeks)-continuousoutcomes-Pain(NRS)-MeanSD-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(2weeks)-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(2weeks)-dichotomousoutcomes-Adverseevents-Nominal-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Alibakhshi, 2016

Bibliographic Reference	Alibakhshi, Hossein; Samaei, Afshin; Amoozadeh Khalili, Mohammad; Siminghalam, Mona; A comparetive study on the effects of mirror therapy and bilateral arm training on hand function of chronichemiparetic patients; Koomesh; 2016; 589-595

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Iran.
Study setting	Inpatient hospital.
Study dates	No additional information.
Sources of funding	Neuromuscular Rehabilitation Research Centre - Semnan University of Medical Sciences.
Inclusion criteria	Stroke >6 months; ability to understand treatment guidelines.
Exclusion criteria	Any structural abnormalities that prevent the execution; any cognitive or perceptual deficit that can affect the implementation of treatment; visual deficits.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=12 Bilateral upper limb mirror therapy. 3 weeks, 5 days a week, 30 minutes a day.
Comparator	Usual care N=12 Bilateral arm training without mirror. 3 weeks, 5 days a week, 30 minutes a day.
Number of participants	24
Duration of follow-up	3 weeks (duration of the treatment), 1 month and 3 weeks (1 month after the treatment ended)
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 12)

Bilateral upper limb mirror therapy. 3 weeks, 5 days a week, 30 minutes a day.

Usual care (N = 12)

Bilateral arm training without mirror. 3 weeks, 5 days a week, 30 minutes a day.

Characteristics

Study-level characteristics

Characteristic	Study (N = 24)
% Female Nominal	9
Mean age (SD) Mean (SD)	50.9 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NA
Left Nominal	15

Characteristic	Study (N = 24)
Right Nominal	9

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 3 week, N = 12	Usual care, Baseline, N = 12	Usual care, 3 week, N = 12
Fugl-Meyer Upper Extremity motor Scale range: 0-66. However, one of the values is above 66 - included in the Cochrane review. Mean (SD)	NR (NR)	69 (7.4)	NR (NR)	54.2 (9.6)
Motor function (Box and Block Test) Number of blocks transferred in 60 seconds Mean (SD)	NR (NR)	7.6 (7.7)	NR (NR)	0.8 (1.2)
Motor impairment (Jamar Dynamometer for grip strength) (kg) Mean (SD)	NR (NR)	69 (7.4)	NR (NR)	54.2 (9.6)

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Motor function (Box and Block Test) - Polarity - Higher values are better

Motor impairment (Jamar Dynamometer for grip strength) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Baseline, Mirror therapy, N = 12	Baseline, Usual care, N = 12	3 week, Mirror therapy, N = 12	3 week, Usual care, N = 12
Dropouts Nominal	NA	NA	0	0

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Fugl-MeyerUpperExtremitymotor-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(JamarDynamometerforgripstrength)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Altschuler, 1999

Bibliographic Reference	Altschuler, Eric Lewin; Wisdom, Sidney B; Stone, Lance; Foster, Chris; Galasko, Douglas; Llewellyn, D Mark E; Ramachandran, Vilayanur Subramanian; Rehabilitation of hemiparesis after stroke with a mirror; The Lancet; 1999; vol. 353 (no. 9169); 2035-2036

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	USA.
Study setting	Not stated.
Study dates	No additional information.
Sources of funding	Not stated.
Inclusion criteria	At least 6 months post-stroke.
Exclusion criteria	No additional information.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=4 (9 in total considering both phases of the trial) 4 weeks of mirror therapy: people were instructed to move the non-paretic arm while looking in the mirror and moving the paretic arm as best as they could; followed by 4 weeks of control therapy, using transparent plastic instead of a mirror (only the first phase of the trial was analysed)

Comparator	Sham therapy N=5 (9 in total considering both phases of the trial) 4 weeks of control therapy where people were instructed to move the non-paretic arm while looking into transparent plastic and moving the paretic arm as best as they could; followed by 4 weeks of mirror therapy (only the first phase of the trial was analysed)
Number of participants	9
Duration of follow-up	4 weeks (end of each trial, 8 weeks in total considering both phases).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mixed
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	Severity: 1 mild, 1 moderate, 1 moderate-severe, 4 severe, 2 extremely severe. Type of stroke: 6 right sided cerebrovascular accident, 1 left sided cerebrovascular accident, 2 right sided arteriovenous malformation.

Study arms

Mirror therapy (N = 4)

4 weeks of mirror therapy: people were instructed to move the non-paretic arm while looking in the mirror and moving the paretic arm as best as they could; followed by 4 weeks of control therapy, using transparent plastic instead of a mirror (only the first phase of the trial was analysed)

Sham therapy (N = 5)

4 weeks of control therapy where people were instructed to move the non-paretic arm while looking into transparent plastic and moving the paretic arm as best as they could; followed by 4 weeks of mirror therapy (only the first phase of the trial was analysed)

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 4)	Sham therapy (N = 5)
% Female Nominal	2	2
Mean age (SD) Mean (SD)	55.8 (NR)	60.2 (NR)
Ethnicity Nominal	NR	NR

Characteristic	Mirror therapy (N = 4)	Sham therapy (N = 5)
Comorbidities Nominal	NR	NR
Mild Nominal	0	1
Moderate Nominal	1	0
Moderate-severe Nominal	1	0
Severe Nominal	0	4
Extremely severe Nominal	2	0
Cerebrovascular accident Nominal	4	3
Arteriovenous malformation Nominal	0	2
Time period since stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 4	Mirror therapy, 4 week, N = 4	Sham therapy, Baseline, N = 5	Sham therapy, 4 week, N = 5
Dropout Nominal	NA	0	NA	0

Dropout - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Cross-over trial

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropout-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Amasyali, 2016

Bibliographic Reference	Amasyali, Saliha Y; Yaliman, Ayşe; Comparison of the effects of mirror therapy and electromyography-triggered neuromuscular stimulation on hand functions in stroke patients: a pilot study; International Journal of Rehabilitation Research; 2016; vol. 39 (no. 4); 302-307

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Turkey.
Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Ischaemic stroke during the previous 12 months, between 20 and 85 years old, could understand simple verbal instructions (MMSE > 21), BRS between stage 2 and 5 for the hand, mAS < 3
Exclusion criteria	Not stated.

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=9 Unaffected wrist, hand flexion, extension and forearm circumduction, and supination–pronation movements, participants practised at home after supervised sessions for an additional 30 minutes a day. Concomitant therapy: Conventional physiotherapy programme 3 weeks, 5 days a week, 2 hours a day.
Comparator	Usual care N=15 Two groups: One received EMG-triggered electrical muscle stimulation of wrist and finger extensor muscles (pulse duration 200 gs, frequency 50 Hz, 1 sec ramp up, 5 sec biphasic stimulation, 1 sec ramp down; intensity was determined for each participant) for an additional 30 minutes a day. The second group received no additional treatment. Concomitant therapy: Conventional physiotherapy programme 3 weeks, 5 days a week, 2 hours a day.
Number of participants	24
Duration of follow-up	3 weeks (end of intervention). Follow up is available at 3 months but won't be included in this analysis.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 9)

Unaffected wrist, hand flexion, extension and forearm circumduction, and supination–pronation movements, participants practised at home after supervised sessions for an additional 30 minutes a day. Concomitant therapy: Conventional physiotherapy programme 3 weeks, 5 days a week, 2 hours a day.

Usual care (N = 15)

Two groups: One received EMG-triggered electrical muscle stimulation of wrist and finger extensor muscles (pulse duration 200 gs, frequency 50 Hz, 1 sec ramp up, 5 sec biphasic stimulation, 1 sec ramp down; intensity was determined for each participant) for an additional 30 minutes a day. The second group received no additional treatment. Concomitant therapy: Conventional physiotherapy programme 3 weeks, 5 days a week, 2 hours a day.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 9)	Usual care (N = 15)
% Female Nominal	5	6
Mean age (SD) (years) Mean (SD)	58.78 (10.12)	58.8 (12.78)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Cortical Nominal	4	6
Subcortical Nominal	4	8
Corticosubcortical Nominal	1	1

Characteristic	Mirror therapy (N = 9)	Usual care (N = 15)
Time period since stroke (Months) Mean (SD)	4.11 (2.14)	5.94 (2.15)
Right Nominal	4	12
Left Nominal	5	3

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 3 week, N = 9	Usual care, Baseline, N = 15	Usual care, 3 week, N = 15
Upper limb motor function (Box and Block Test) (number of blocks placed in the other partition) Final value. Mean (SD)	11.67 (11.56)	13.9 (11.2)	12.27 (11.93)	15.86 (13.65)

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 3 week, N = 9	Usual care, Baseline, N = 15	Usual care, 3 week, N = 15
motor impairment (grip force) Final value. Likely unit kg (not stated). Mean (SD)	3.33 (3.77)	5.11 (4.64)	2.8 (4.08)	4.47 (4.98)
Fugl-Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	36.55 (17.8)	48.66 (15.5)	40.4 (17.85)	48 (16.76)

Upper limb motor function (Box and Block Test) - Polarity - Higher values are better

motor impairment (grip force) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 3 week, N = 9	Usual care, Baseline, N = 15	Usual care, 3 week, N = 15
Dropouts Nominal	NA	2	NA	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-motorimpairment(gripforce)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FugI-MeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Antoniotti, 2019

Bibliographic Reference	Antoniotti, P.; Veronelli, L.; Caronni, A.; Monti, A.; Aristidou, E.; Montesano, M.; Corbo, M.; No evidence of effectiveness of mirror therapy early after stroke: an assessor-blinded randomized controlled trial; Clinical Rehabilitation; 2019; vol. 33 (no. 5); 885-893

Study details

Other publications associated with this study included in review	NR
Trial name / registration number	NCT03418883
Study location	Italy
Study setting	Rehabilitation unit
Study dates	NR
Sources of funding	The author(s) received no financial support for the research, authorship and/or publication of this article

Inclusion criteria	first ischaemic or haemorrhagic stroke causing right or left hemiplegia or hemiparesis; enrolling in the trial within four weeks from the stroke; age between 18 and 80 years; Mini Mental State Examination, score ⩾24, in order to exclude patients with significant cognitive decline; an Token Test score <40, in order to exclude patients with severe verbal comprehension deficits.
Exclusion criteria	significant visual impairment despite glasses, cognitive deficits that could prevent patients from understanding the therapist instructions and an additional neurological or orthopaedic disease (e.g. Parkinson's disease or limb amputation) known to cause a motor impairment for itself.
Recruitment / selection of participants	Stroke patients were referred to the study by their physician during their inpatient stay.
Intervention(s)	During mirror therapy, the patient was sitting on a conventional chair and placed her or his forearms on a table. A mirror (45 cm × 40 cm) was positioned between the two arms, at right angle with the patient's trunk. The reflective surface was oriented so that the participant could easily see the mirror image of his or her sound arm. Intervention and control group patients exercised the very same movements. In particular, movements were organized into three classes (simple, complex and functional movements). Patients were asked to move their sound arm while looking the mirror reflective surface (intervention group) or the opaque surface (control group). Patients were also asked to stay still with the impaired arm. Both mirror therapy and sham therapy consisted of one-on-one sessions (one therapist treated one patient), lasting 30minutes each and administered once daily, five days per week for 30 days. From day 1 to 10, from day 11 to 20 and from day 21 to 30, patients practised simple, complex and functional movements, respectively. In each session, 10 different movements were practised. Mirror therapy and sham therapy were administered in a quiet room close to the rehabilitation gym In addition to the intervention or control treatment, all patients participated in a conventional rehabilitation programme consisting of physio therapy (45minutes per session, twice daily, five days per week) and occupational therapy (45minutes per session, once a day, two to five days per week according to the physician prescription). Stroke rehabilitation may include some or all of the following activities: strengthening, motor skills, mobility training, range of motion therapy, weak electrical stimulation and virtual reality. If necessary, pharmacological and/or counselling for mood disorders were administered; speech, language therapy and neuropsychological therapy were provided as needed. All treatments were one on-one sessions.

Comparator	During sham therapy, the mirror was flipped so that the opaque surface faced the sound arm. In particular, movements were organized into three classes (simple, complex and functional movements). Patients were asked to move their sound arm while looking the mirror reflective surface (intervention group) or the opaque surface (control group). Patients were also asked to stay still with the impaired arm. Both mirror therapy and sham therapy consisted of one-on-one sessions (one therapist treated one patient), lasting 30minutes each and administered once daily, five days per week for 30 days. From day 1 to 10, from day 11 to 20 and from day 21 to 30, patients practised simple, complex and functional movements, respectively. In each session, 10 different movements were practised. Mirror therapy and sham therapy were administered in a quiet room close to the rehabilitation gym In addition to the intervention or control treatment, all patients participated in a conventional rehabilitation programme consisting of physio therapy (45minutes per session, twice daily, five days per week) and occupational therapy (45minutes per session, once a day, two to five days per week according to the physician prescription). Stroke rehabilitation may include some or all of the following activities: strengthening, motor skills, mobility training, range of motion therapy, weak electrical stimulation and virtual reality. If necessary, pharmacological and/or counselling for mood disorders were administered; speech, language therapy and neuropsychological therapy were provided as needed. All treatments were one on-one sessions.
Number of participants	40
Duration of follow-up	6 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 20)

sham therapy (N = 20)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 40)**
% Female Nominal	14

Characteristic	Study (N = 40)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR

Arm-level characteristics

Characteristic	mirror therapy (N = 20)	sham therapy (N = 20)
Mean age (SD) Mean (SD)	68.2 (14.4)	69.5 (14.1)
Time period since stroke Mean (SD)	22.6 (12.3)	27.5 (6.7)
side of paresis (left) Nominal	13	13

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	mirror therapy, Baseline, N = 20	mirror therapy, 6 week, N = 20	sham therapy, Baseline, N = 20	sham therapy, 6 week, N = 20
Upper limb motor function (Action Research Arm Test) 0-57 Mean (SD)	23.5 (24)	30 (24.1)	25.1 (25.5)	31.9 (23)
Fugl-Meyer Assessment Upper Extremity Mean (SD)	28.5 (21.8)	38.3 (23.4)	30.9 (23.9)	40.6 (21.3)
ADLS (Functional Independence Measure) Mean (SD)	72.9 (17.8)	99.4 (22.6)	71 (20.6)	100.3 (21.9)
Drop outs Nominal	0	4	0	1

Upper limb motor function (Action Research Arm Test) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

ADLS (Functional Independence Measure) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-Upperlimbmotorfunction(ActionResearchArmTest)-MeanSD-mirror therapy-sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-mirror therapy-sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-Dropouts-Nominal-mirror therapy-sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-ADLS(FunctionalIndependenceMeasure)-MeanSD-mirror therapy-sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Armat, 2022

Bibliographic Reference	Armat, MR; Mortazavi, H; Akbari, H; Zeydi, AE; Sarani, A; Using Mirror Therapy to Optimize the Efficacy of Balance Programs for Older Adults With Poststroke Balance Impairment; Rehabilitation nursing; 2022

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	IRCT20180526039851N1
Study type	Randomised controlled trial (RCT)
Study location	Iran

Study setting	Two hospitals in Bojnurd (a city in northeast Iran)
Study dates	NR
Sources of funding	None
Inclusion criteria	People with balance impairment because of movement problems in one leg within the last 6 months; being oriented and able to communicate; having a caregiver to assist with the balance exercises and mirror therapy; and not suffering from any injuries or diseases making balance exercises and mirror therapy hazardous.
Exclusion criteria	Any evidence suggesting incomplete training (not answering reminder phone calls, inconsistency in reporting about the trainings, etc.); any unexpected events (falls, illness, dizziness, influenza, etc.) that could disturb balance training.
Recruitment / selection of participants	Initially, medical records of all stroke patients (n = 443) within the last 6 months in two hospitals in Bojnurd (a city in northeast Iran) between January and August 2019 were assessed. Based on inclusion criteria and sample size calculation, 40 stroke survivors were included in the study.
Intervention(s)	The protocol consisted of two parts. The first part included regular balance exercises (the same for the control and experimental group), and the second part included mirror therapy for the experimental group and sham treatment with a non-reflective plate for the control group. Both parts of the protocol were explained at the home of the stroke survivor by the same instructor (a geriatric nurse) for 1 week. During the instructions, the instructor observed the patients and their caregivers performing the balance exercises and the mirror therapy to make sure they could implement the protocol appropriately and independently. To ensure the patients and caregivers performed the protocol routinely for the remaining 3 weeks, the instructor made repeated phone calls 5 days a week to remind them of the exercises and instructions. In the first part of the protocol, participants practiced sitting on a chair, standing up, and standing back and forth while keeping their feet parallel. The participants in both groups implemented the leg movements barefoot while they were sitting in a semisitting position on a chair. The leg movements included (1) hip-knee-ankle flexion, (2) knee extension with ankle dorsiflexion, and (3) knee flexion beyond 90 degrees. The caregivers were taught by a geriatric nurse, one of the research team, to assist the patients with the balance exercises. Caregivers were instructed to assist the patients by checking the chair for any broken or defective parts, holding patients' hands to avoid falls, monitoring the sequence of the exercises, mimicking the exercises for the patients, and checking the patients' performance. In addition, caregivers were instructed to use a checklist to make sure exercises were done routinely for half an hour, 5 days a week, for 4 weeks. If patients were feeling any pain or discomfort, exercises were stopped and a report was given to the instructor. A manual containing the guide for the exercises and a phone number for any questions and reports was also given to the caregivers. This part of the protocol was the same in the intervention and control groups. In the second part of the protocol, a 50 x 100 cm mirror was used in the intervention group, and a same-sized nonreflective plate was used for sham treatment in the control group. The mirrors were prepared with the help of the instructor and other research team members and included a rubber edge trim to protect the patients and caregivers against the sharp edge of the mirrors. The participants were in a sitting position in both

	groups while the mirror or nonreflective plate was placed between the participants' affected and healthy legs. The caregivers were instructed to hold the mirror between the patient's legs in a vertical position while the side of the mirror with the 50-cm length was on the floor. The participants in the intervention group moved their healthy leg while watching their reflection in the mirror in place of the affected leg.
Comparator	The same protocol was administered to the control group, except that a nonreflective plate was used instead of a mirror. The participants in the control group performed the same exercises, but they could not see the reflection of their healthy leg because the plate was nonreflective.
Number of participants	40
Duration of follow-up	4 weeks
Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	NR

Study arms

Mirror therapy (N = 21)

The intervention group received balance exercises along with with mirror therapy for half an hour, 5 days a week, for 4 weeks

Sham mirror therapy (N = 19)

The control group received the same balance exercises without mirror therapy (a nonreflective plate was used instead) for the same duration.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 21)**	**Sham mirror therapy (N = 19)**
% Female Sample size	n = 9 ; % = 42.9	n = 8 ; % = 42.1
Mean age (SD) (years) Mean (SD)	67.2 (7.53)	68.6 (10.76)
Ethnicity Nominal	NR	NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Mirror therapy (N = 21)	Sham mirror therapy (N = 19)
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 4 week

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 21	Mirror therapy, 4 week, N = 19	Sham mirror therapy, Baseline, N = 19	Sham mirror therapy, 4 week, N = 19
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Change scores. Mean (SD)	35.89 (3.9)	2 (1.49)	34.76 (3.7)	0.3 (0.47)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Lowerlimbmotorfunction(BergBalancescale)changescore-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Arya, 2019

Bibliographic Reference	Arya, K. N.; Pandian, S.; Kumar, V.; Effect of activity-based mirror therapy on lower limb motor-recovery and gait in stroke: A randomised controlled trial; Neuropsychological Rehabilitation; 2019; vol. 29 (no. 8); 1193-1210

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	Clinical Trial Registry of India: CTRI/2016/09/007256.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	The occupational therapy department of a rehabilitation institute.
Study dates	No additional information.
Sources of funding	Financially supported by Pandit Deendayal Upadhayaya National Institute for Persons with Physical Disabilities, 4 VD Marg, New Delhi-110002, India [107/SC/PDUIPH].
Inclusion criteria	Poststroke hemiparesis due to unilateral stroke; poststroke duration >6 months; paresis of either right or left side; age range between 30 to 60 years; functional ambulation classification level 2 and above; ability to walk for a distance of at least 10 metres without any orthosis and walking device.
Exclusion criteria	Any other associated neurological disorder; severe cognitive and perceptual and visual deficits (evaluated by the National Institutes of Health Stroke Subscales, and copying, drawing, line bisection, cancellation and functional tasks); cardiovascular instability; any musculoskeletal disorder affecting locomotion.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=19 Activity-based mirror therapy including movements such as ball-rolling, rocket-board and pedalling, and conventional mirror therapy for 30 sessions of 1 hour each (3-4/week) provided for 3 months. Conventional motor therapy for 30 minutes of each session.
Comparator	Usual care N=17 Conventional motor therapy for 1 hour of each session, 30 sessions provided over 3 months.
Number of participants	36

Duration of follow-up	3 months.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 19)

Activity-based mirror therapy including movements such as ball-rolling, rocket-board and pedalling, and conventional mirror therapy for 30 sessions of 1 hour each (3-4/week) provided for 3 months. Conventional motor therapy for 30 minutes of each session.

Usual care (N = 17)

Conventional motor therapy for 1 hour of each session, 30 sessions provided over 3 months.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 19)	Usual care (N = 17)
% Female Nominal	4	2
Mean age (SD) Mean (SD)	48.16 (8.36)	44.53 (6.09)
Ethnicity Nominal	NR	NR
Hypertension Nominal	14	12
Alcoholism Nominal	7	8
Diabetes mellitus Nominal	13	6
Obesity Nominal	3	2

Characteristic	Mirror therapy (N = 19)	Usual care (N = 17)
Severity Nominal	NR	NR
Ischaemic Nominal	15	12
Haemorrhagic Nominal	4	5
Time period since stroke (Months) Mean (SD)	13.74 (9.45)	18.29 (8.08)
Left Nominal	9	7
Right Nominal	10	10

Outcomes

Study timepoints

- Baseline
- 3 month (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 3 month, N = 19	Usual care, Baseline, N = 17	Usual care, 3 month, N = 17
Motor impairment (Fugl Meyer Lower Extremity) Scale range: 0-28. Final value. Mean (SD)	19.13 (6.03)	23 (6.84)	22.06 (7.38)	22.41 (6.95)

Motor impairment (Fugl Meyer Lower Extremity) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 3 month, N = 19	Usual care, Baseline, N = 17	Usual care, 3 month, N = 17
Dropouts Nominal	NA	1	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(FuglMeyerLowerExtremity)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Arya, 2018

Bibliographic Reference	Arya, K. N.; Pandian, S.; Vikas; Puri, V.; Mirror Illusion for Sensori-Motor Training in Stroke: A Randomized Controlled Trial; Journal of Stroke & Cerebrovascular Diseases; 2018; vol. 27 (no. 11); 3236-3246

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)

Study location	India.
Study setting	People were recruited from a national-level rehabilitation institute situated in an urban city.
Study dates	No additional information.
Sources of funding	Indian Council of Medical Research, 5/4-5/2/ADR/2014-NCD-I, New Delhi, India.
Inclusion criteria	Unilateral stroke of >6 months; hemiparesis of the right or left side; age between 30 and 60 years; sensory deficit in the palamar aspect of the hand and fingers (assessed by the Semmes-Weinstein monofilaments as no more than diminished light touch).
Exclusion criteria	Cognitive and perceptual deficits (determined clinically by trail making test, digit span, copying and drawing, line-bisection and functional performance); receptive communicative disorder; contracture of hand muscles or any fixed wrist/hand/finger deformity; complex regional pain syndrome; diabetic or any other type of neuropathy; skin disorder affecting the upper limb.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=17 Mirror therapy 30 sessions, 40 minutes each across the 6 weeks (5/week). Specifically using a mirrored wall of a frame/box and hiding the affected limb. The people were provided with sensory stimuli (various textures, size, and shape) on the less affected and the affected hands simultaneously to induce mirror illusion for sensory stimulation. Object recognition was performed without visual occlusion. Each sensory stimulation was imparted for 2-5 minutes to a total of 20 minutes. People were also provided need-based auditory feedback and stabilisation of the paretic limb (by another therapist). The practice of the paretic wrist and hand using various tasks were also conducted as mirror therapy. Additionally, 50 minutes of conventional occupational therapy was provided.
Comparator	Usual care N=14 50 minutes of conventional occupational therapy was provided.
Number of participants	31
Duration of follow-up	6 weeks.

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 17)

Mirror therapy 30 sessions, 40 minutes each across the 6 weeks (5/week). Specifically using a mirrored wall of a frame/box and hiding the affected limb. The people were provided with sensory stimuli (various textures, size, and shape) on the less affected and the affected hands simultaneously to induce mirror illusion for sensory stimulation. Object recognition was performed without visual occlusion. Each sensory stimulation was imparted for 2-5 minutes to a total of 20 minutes. People were also provided need-based auditory feedback and stabilisation of the paretic limb (by another therapist). The practice of the paretic wrist and hand using various tasks were also conducted as mirror therapy. Additionally, 50 minutes of conventional occupational therapy was provided.

Usual care (N = 14)

50 minutes of conventional occupational therapy was provided.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 17)	Usual care (N = 14)
% Female Nominal	4	1
Mean age (SD) Mean (SD)	44.12 (9.08)	47.93 (9.1)
Ethnicity Nominal	NR	NR
Hypertension Nominal	13	14
Alcoholism Nominal	0	2
Diabetes mellitus Nominal	2	5

Characteristic	Mirror therapy (N = 17)	Usual care (N = 14)
Obesity Nominal	2	0
Severity Nominal	NR	NR
Ischaemic Nominal	8	6
Haemorrhagic Nominal	9	8
Time period since stroke (Months) Mean (SD)	13.35 (10.12)	17 (13.28)
Left Nominal	8	5
Right Nominal	9	9

Outcomes

Study timepoints

- Baseline
- 6 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 6 week, N = 17	Usual care, Baseline, N = 14	Usual care, 6 week, N = 14
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	12.12 (11.14)	16.18 (10.62)	15.14 (10.61)	16.13 (10.59)

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 6 week, N = 17	Usual care, Baseline, N = 14	Usual care, 6 week, N = 14
Dropouts Nominal	NA	1	NA	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Arya, 2015

Bibliographic Reference	Arya, Kamal Narayan; Pandian, Shanta; Kumar, Dharmendra; Puri, Vinod; Task-based mirror therapy augmenting motor recovery in poststroke hemiparesis: a randomized controlled trial; Journal of Stroke and Cerebrovascular Diseases; 2015; vol. 24 (no. 8); 1738-1748

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with	No additional information.

this study included in review	
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	Inpatient hospital.
Study dates	No additional information.
Sources of funding	Not stated.
Inclusion criteria	Aged < 60 years, single unilateral stroke with hemiparesis, more than 24 weeks poststroke, able to understand instructions, Brunnstrom recovery stage of arm (BRS-A) 2 or above.
Exclusion criteria	Associated neurological complications, severe perceptual and visual deficits (as evaluated by the National Institutes of Health Stroke Subscales and clinical tests: copying and drawing, line-bisection, cancellation tasks, and functional performance), shoulder subluxation, uncontrolled medical illness.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=17 Mirror therapy: participants observed mirror image of task-specific movements of the less affected upper limb, each task 20 to 100 times in an increment of 5 to 10 a session. 8 weeks, 5 days a week, 45 minutes MT, additional 45 minutes usual occupational therapy (usual occupational therapy using principles of Brunnstrom and Bobath approaches).
Comparator	Usual care N=16 Usual occupational therapy using principles of Brunnstrom and Bobath approaches 8 weeks, 5 days a week, 90 minutes usual occupational therapy.
Number of participants	33.

Duration of follow-up	8 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	Type of stroke: Mixture of ischaemic and haemorrhagic. See participants characteristics table.

Study arms

Mirror therapy (N = 17)

Mirror therapy: participants observed mirror image of task-specific movements of the less affected upper limb, each task 20 to 100 times in an increment of 5 to 10 a session. 8 weeks, 5 days a week, 45 minutes MT, additional 45 minutes usual occupational therapy (usual occupational therapy using principles of Brunnstrom and Bobath approaches).

Usual care (N = 16)

Usual occupational therapy using principles of Brunnstrom and Bobath approaches 8 weeks, 5 days a week, 90 minutes usual occupational therapy.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 17)	Usual care (N = 16)
% Female Sample size	n = 2 ; % = 12	n = 6 ; % = 37.5
Mean age (SD) (years) Mean (SD)	48.76 (13.58)	42.12 (12.52)
Ethnicity Nominal	NR	NR
Hypertension Nominal	10	12
Diabetes mellitus Nominal	6	3
Obesity Nominal	5	3
Poststroke depression	2	1

Characteristic	Mirror therapy (N = 17)	Usual care (N = 16)
Nominal		
Severity Nominal	NR	NR
Ischaemic Nominal	7	10
Haemorrhagic Nominal	10	6
Time period since stroke (Months) Mean (SD)	12.88 (8.05)	12.25 (5.74)

Outcomes

Study timepoints

- Baseline
- 8 week (Postintervention)

Mirror therapy compared to usual care at postintervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 8 week, N = 17	Usual care, Baseline, N = 16	Usual care, 8 week, N = 16
Fugl-Meyer Upper Extremity motor Scale range: 0-66. Final value. Mean (SD)	19.71 (7.22)	30.41 (9.07)	18.25 (5.43)	23 (5.58)

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Mirror therapy compared to usual care at postintervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 8 week, N = 17	Usual care, Baseline, N = 16	Usual care, 8 week, N = 16
Dropouts Nominal	NA	0	NA	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatpostintervention-continuousoutcome-Fugl-MeyerUpperExtremitymotor-MeanSD-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatpostintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Bae, 2012

Bibliographic Reference	Bae, Sea Hyun; Jeong, Woo Sik; Kim, Kyung Yoon; Effects of mirror therapy on subacute stroke patients' brain waves and upper extremity functions; Journal of Physical Therapy Science; 2012; vol. 24 (no. 11); 1119-1122

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	

Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatient rehabilitation centre.
Study dates	No additional information.
Sources of funding	Not stated.
Inclusion criteria	Onset of stroke within 6 months
Exclusion criteria	Did not understand treatment method of the study, MMSE < 16, visual impairment, damage on musculoskeletal system or peripheral nerve on paretic side, mAS score > 2, Brunnstrom recovery stage 1, 5 or 6.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Participants observed their unaffected upper limb in mirror while performing movements of both arms, 5 exercises for 6 minutes, 5 times a session. 4 weeks, 5 days a week, 30 minutes.
Comparator	Sham therapy N=10 Participants performed the same treatment protocol as in group 1 but only for the paretic arm. 4 weeks, 5 days a week, 30 minutes.
Number of participants	20
Duration of follow-up	4 weeks (end of intervention)
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 10)

Participants observed their unaffected upper limb in mirror while performing movements of both arms, 5 exercises for 6 minutes, 5 times a session. 4 weeks, 5 days a week, 30 minutes.

Sham therapy (N = 10)

Participants performed the same treatment protocol as in group 1 but only for the paretic arm. 4 weeks, 5 days a week, 30 minutes.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 10)	Sham therapy (N = 10)
% Female Nominal	4	3
Mean age (SD) (years) Mean (SD)	55.2 (8.5)	52.6 (11.2)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Haemorrhagic Nominal	6	5
Ischaemic Nominal	4	5
Time period since stroke (month) Mean (SD)	4.4 (1.1)	4.8 (1)

Characteristic	Mirror therapy (N = 10)	Sham therapy (N = 10)
Left Nominal	7	6
Right Nominal	3	4

Outcomes

Study timepoints

- Baseline
- 4 week

Mirror therapy compared to sham therapy at end of intervention (4 weeks) - continuous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 10
Upper limb and hand motor function (Manual function test) Scale range: 0-32. Final value. Mean (SD)	12.4 (2.37)	17.1 (3.03)	13.1 (2.28)	14.2 (2.34)

Upper limb and hand motor function (Manual function test) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention(4weeks)-continuousoutcome-Upperlimbandhandmotorfunction(Manualfunctiontest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Bahrami, 2013

Bibliographic Reference	Bahrami, Mahnaz; Mazloom, Seyed Reza; Hasanzadeh, Farzaneh; Ghandehari, Kavian; The Effect of Mirror Therapy on Self-Care stroke patients; Journal of Mazandaran University of Medical Sciences (JMUMS); 2013; vol. 23 (no. 107)

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Iran.
Study setting	Not stated.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	1st unilateral stroke (ischaemic or haemorrhagic verified by CT-scan or MRI), between 1 month and 1 year after stroke, Brunnstrom recovery stages 1 - 3
Exclusion criteria	Severe cognitive deficit, severe aphasia, visual deficits, dementia, not able to understand instructions, did not participate in 4 sessions or 2 consecutive sessions
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=25 Participants observed movements of healthy upper and lower extremities in front of the mirror (20 sessions, 3 to 5 days a week, additional 30 minutes mirror therapy) with physiotherapy and neuromuscular stimulation 20 sessions, 3 to 5 days a week, 30 minutes.
Comparator	Usual care N=25 Physiotherapy and neuromuscular stimulation 20 sessions, 3 to 5 days a week, 30 minutes.
Number of participants	50.
Duration of follow-up	4-6 weeks in total (20 session, 3-5 days per week). Latest follow up available was at the 15th session.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Mixed

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Both
Subgroup analysis - further details	Type of stroke: Ischaemic or haemorrhagic - no information about the number of participants with each.

Study arms

Mirror therapy (N = 25)

Participants observed movements of healthy upper and lower extremities in front of the mirror (20 sessions, 3 to 5 days a week, additional 30 minutes mirror therapy) with physiotherapy and neuromuscular stimulation 20 sessions, 3 to 5 days a week, 30 minutes.

Usual care (N = 25)

Physiotherapy and neuromuscular stimulation 20 sessions, 3 to 5 days a week, 30 minutes.

Characteristics

Study-level characteristics

Characteristic	Study (N = 50)
% Female Nominal	NR
Mean age (SD) Nominal	NR
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Outcomes

Study timepoints

- Baseline
- 4 week (Taking the average time that 15 sessions will have been completed at. Not end of intervention, so will be downgraded for outcome indirectness.)

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 25	Mirror therapy, 4 week, N = 25	Usual care, Baseline, N = 25	Usual care, 4 week, N = 25
Dropouts Was not included in the forest plot for the Cochrane analysis Nominal	NR	0	NR	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(Downgraded for outcome indirectness due to short follow up duration (less than end of intervention))*

Bai, 2019

Bibliographic Reference	Bai, Z.; Zhang, J.; Zhang, Z.; Shu, T.; Niu, W.; Comparison Between Movement-Based and Task-Based Mirror Therapies on Improving Upper Limb Functions in Patients With Stroke: A Pilot Randomized Controlled Trial; Frontiers in neurology [electronic resource].; 2019; vol. 10; 288

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	This study was retrospectively registered in the Chinese Clinical Trial Registry (no. ChiCTR1800019043)
Study location	China
Study setting	rehabilitation hospital
Study dates	June 7, 2016, and April 11, 2018

Sources of funding	This work was supported by the Fundamental Research Funds for the Central Universities (No. 22120180401) and Research Project of Shanghai Disabled Person' Federation (2016).
Inclusion criteria	Participants who met all of the following criteria were included: (1) a first-ever unilateral ischaemic or haemorrhagic cerebrovascular accident with onset between 1 and 6 months; (2) mild to moderate motor impairment, level 3 to 5 in the Functional Test for the Hemiplegic Upper Extremity (23); (3) mild to moderate degree of spasticity in all joints of the affected upper limb; and (4) sufficient cognitive ability to follow instructions (Mini-mental State Examination score >24)
Exclusion criteria	Patients who met any of the following criteria were excluded: (1) participation in another drug or experimental project within 3 months; (2) aphasia; (3) serious unilateral neglect (Star Cancellation Test ≤ 44/54) or visual field deficiency; (4) any other comorbid neurological diseases except for stroke; and (5) diagnosis of any other neuromuscular or orthopaedic disease in the upper extremities.
Recruitment / selection of participants	Participant Recruitment All participants were recruited from a rehabilitation hospital between June 7, 2016, and April 11, 2018. The participants were referred for this study by their occupational therapists in charge. A total of 95 post-stroke patients were screened
Intervention(s)	Participants in the MMT group underwent the same physiotherapy as that in the CT group. During the Movement based MT training, the participants were instructed to sit on a chair in front of a table. A mirror on the table was positioned perpendicular to the participants. The affected hand was positioned behind the mirror, whereas the unaffected hand was placed in the front of the reflective surface. Thereby, the participants were asked to view the reflected upper limbs in the mirror instead of their real upper limb. Once the training started, the participants were asked to perform some simple movements with the affected upper limb, such as (1) finger tapping, (2) griping and releasing, (3) wrist ulnar and radial derivations, (4) wrist extension and flexion, (5) forearm pronation and supination, (6) elbow extension and flexion, (7) moving the affected arm from the middle position to the lateral side, and (8) lifting the hand up and returning it to the table. Each movement was repetitively performed for 3–4 min, with a total of 30 min for 1 MMT session. A 30-s break was allowed intermittently when changing the movements. The task-oriented training for upper limb motor function and ADL training was conducted in the remaining 1 h, which was the same as that in the CT group. The treatment dose of the MMT group was similar to that of the CT group: 5 days/week, for a total of 4 weeks between the pre-test and post-test. After the post-test, the participants underwent the same training as the CT group until discharge. All procedures and setup for the TMT training were the same as those for the MMT training. However, the upper limb movements performed in TMT were tasks instead of simple movements. Six tasks were performed with the affected hand during TMT, including (1) transferring small cubes from the middle position to the lateral side, (2) placing pegs in holes and taking them out, (3) turning over paper cards, (4) placing steel needles in holes, (5) stacking blocks, and (6) putting cups on

	a shelf. During performing the tasks with the unaffected hand, the participants were instructed to move their affected arm synchronically in the same way while viewing the mirror. Each task should be performed for at least 4 min, with a total of 30 min for one TMT session. The participants could have a 30- s break intermittently when changing tasks. The training in the remaining 1 h and the dose were the same as those in the CT group, 5 days per week, for a total of 4 weeks between the pre-test and post-test. After the post-test, the participants underwent the same training as the CT group until discharge.
Comparator	All patients in the CT group underwent multi-disciplinary rehabilitation training, including customary physiotherapy and occupational therapy. The physiotherapy intervention, lasting for 1–2 h/day, focused on the patients' lower limb motor function and ambulation. Usually, physiotherapists applied muscle stretching before active motor training. Moreover, intensive training for ambulation, consisting of dynamic walking balance and gait patterns, was provided for the included participants. For occupational therapy intervention, the participants underwent 1.5 h of training, including customary upper limb functional training and ADL training. In customary upper limb functional training, the primary principle was to apply individual task oriented training for the affected arms to enhance muscle strength, endurance, coordination, and functional use. All participants underwent the interventions 5 days/week, for a total of 4 weeks between the pre-test and post-test. After the post-intervention assessment, they underwent CT as usual until discharge.
Number of participants	34
Duration of follow-up	4 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

movement-based mirror therapy (N = 12)

task-based mirror therapy (N = 11)

conventional treatment (N = 11)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 34)**
% Female Nominal	9
Comorbidities Nominal	NR

Characteristic	Study (N = 34)
Severity Nominal	NR

Arm-level characteristics

Characteristic	movement-based mirror therapy (N = 12)	task-based mirror therapy (N = 11)	conventional treatment (N = 11)
Mean age (SD) Mean (SD)	56.08 (13.61)	54.36 (11.56)	58.27 (15.44)
Type of stroke Ischaemic Nominal	9	7	9
Time period since stroke (days) Mean (SD)	61.92 (35.35)	60 (44.41)	93.45 (59.75)
side of paresis (left) Nominal	6	3	6

Outcomes

Study timepoints

- Baseline

- 4 week

post intervention (4 week) outcomes

Outcome	movement-based mirror therapy, Baseline, N = 12	movement-based mirror therapy, 4 week, N = 12	task-based mirror therapy, Baseline, N = 11	task-based mirror therapy, 4 week, N = 11	conventional treatment, Baseline, N = 11	conventional treatment, 4 week, N = 11
Upper limb and hand motor function (Wolf Motor Function Test) 0-120 Mean (SD)	29.08 (7.38)	37.25 (10.91)	34.55 (9.54)	44.5 (14.17)	26.09 (9.72)	30.82 (12.71)
Fugl Meyer Asessment Upper Extremity 0-66 Mean (SD)	34.25 (12.21)	44.42 (12.89)	37.55 (14.19)	42.82 (13.48)	35.36 (10.62)	39.73 (11.79)
ADLs (Modified Barthel Index) 0-100 Mean (SD)	66.25 (17.73)	80 (13.48)	60.45 (18.36)	78.64 (12.06)	62.27 (16.49)	70.45 (19.93)
Drop outs Nominal	0	0	0	0	0	0

Upper limb and hand motor function (Wolf Motor Function Test) - Polarity - Higher values are better

Fugl Meyer Asessment Upper Extremity - Polarity - Higher values are better

ADLs (Modified Barthel Index) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postintervention(4week)outcomes-ADLs(ModifiedBarthelIndex)-MeanSD-movement-based mirror therapy-task-based mirror therapy-conventional treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study compares task orientated MT and movement based MT but we will combine them)*

postintervention(4week)outcomes-Dropouts-Nominal-movement-based mirror therapy-task-based mirror therapy-conventional treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(study compares task orientated MT and movement based MT but we will combine them)*

postintervention(4week)outcomes-FuglMeyerAsessmentUpperExtremity-MeanSD-movement-based mirror therapy-task-based mirror therapy-conventional treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study compares task orientated MT and movement based MT but we will combine them)*

postintervention(4week)outcomes-Upperlimbandhandmotorfunction(WolfMotorFunctionTest)-MeanSD-movement-based mirror therapy-task-based mirror therapy-conventional treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study compares task orientated MT and movement based MT but we will combine them)*

Bhoraniya, 2018

Bibliographic Reference	Bhoraniya, S. H.; Mishra, D. G.; Parikh, S. M.; The effect of mirror therapy on the gait of chronic stroke patients: A randomized controlled trial; National Journal of Physiology, Pharmacy and Pharmacology; 2018; vol. 8 (no. 9); 1321-1325

Study details

Secondary publication of another included	No additional information.

study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	History of first attack of unilateral ischaemic or haemorrhagic cerebrovascular accident with the onset of more than 6 months; spasticity as per the modified Ashworth scale score <3; no significant cognitive deficit (score more than 25 in the mini-mental state examination scale); able to walk independently with or without the use of walking aids or other supports.
Exclusion criteria	Musculoskeletal disorders; surgical intervention of the lower extremities; unilateral neglect; hemianopia or apraxia.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=13 Mirror therapy and conventional therapy. 15 minutes of mirror therapy and 30 minutes of conventional therapy using a custom made program 5 times a week for 4 weeks.
Comparator	Usual care N=13 Conventional therapy for 45 minutes a session 5 times a week for 4 weeks.

Number of participants	26.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 13)

Mirror therapy and conventional therapy. 15 minutes of mirror therapy and 30 minutes of conventional therapy using a custom made program 5 times a week for 4 weeks.

Usual care (N = 13)

Conventional therapy for 45 minutes a session 5 times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 13)	Usual care (N = 13)
% Female Nominal	4	1
Mean age (SD) Mean (SD)	60.61 (NR)	61.3 (NR)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	8	8

Characteristic	Mirror therapy (N = 13)	Usual care (N = 13)
Haemorrhagic Nominal	5	5
Time period since stroke (Months) Mean (SD)	29.39 (NR)	31.69 (NR)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 13	Mirror therapy, 4 week, N = 13	Usual care, Baseline, N = 13	Usual care, 4 week, N = 13
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Broderick, 2019

Bibliographic Reference	Broderick, P.; Horgan, F.; Blake, C.; Ehrensberger, M.; Simpson, D.; Monaghan, K.; Mirror therapy and treadmill training for patients with chronic stroke: a pilot randomized controlled trial; Topics in Stroke Rehabilitation; 2019; vol. 26 (no. 3); 163-172

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)

Study location	Ireland.
Study setting	Outpatient follow up.
Study dates	June 2015-November 2016.
Sources of funding	No additional information.
Inclusion criteria	>6 months post stroke; discharged from formal rehabilitation; no diagnosis of additional neurological, musculoskeletal or cardiovascular illness; ambulatory with or without a walking aid.
Exclusion criteria	Impaired cognition that would affect the ability to make informed consent (MMSE <25); <18 years of age; visual impariments
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Mirror therapy and treadmill training group 30 minutes a day, 3 days per week for 4 weeks.
Comparator	Sham therapy N=15 Treadmill training with mirror facing a direction where they couldn't see the other leg 30 minutes a day, 3 days per week for 4 weeks.
Number of participants	30.
Duration of follow-up	4 weeks and 3 months.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Mirror therapy and treadmill training group 30 minutes a day, 3 days per week for 4 weeks.

Sham therapy (N = 15)

Treadmill training with mirror facing a direction where they couldn't see the other leg 30 minutes a day, 3 days per week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 15)	Sham therapy (N = 15)
% Female Nominal	5	1
Mean age (SD) Mean (SD)	61.2 (9.5)	67.06 (19.47)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	8	10
Haemorrhagic Nominal	7	5
Time period since stroke (Months) Mean (SD)	75.13 (87.97)	34.26 (30.61)

Characteristic	Mirror therapy (N = 15)	Sham therapy (N = 15)
Left Nominal	8	7
Right Nominal	7	8

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Sham therapy, Baseline, N = 15	Sham therapy, 4 week, N = 15
Motor impairment (Fugl Meyer Lower Extremity) Scale range: 0-34. Final value. Mean (SD)	22.53 (6.12)	27.33 (6.01)	22.53 (7.58)	24.26 (7.2)

Motor impairment (Fugl Meyer Lower Extremity) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcome-Motorimpairment(FuglMeyerLowerExtremity)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Cacchio, 2009

Bibliographic Reference	Cacchio, Angelo; De Blasis, Elisabetta; De Blasis, Vincenzo; Santilli, Valter; Spacca, Giorgio; Mirror therapy in complex regional pain syndrome type 1 of the upper limb in stroke patients; Neurorehabilitation and neural repair; 2009; vol. 23 (no. 8); 792-799

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Italy.
Study setting	Inpatient and outpatient rehabilitation centre.
Study dates	October 2000 to December 2006.
Sources of funding	Not stated.
Inclusion criteria	Hemiparesis after first-ever ischaemic or haemorrhagic stroke; during 1st 6 months post-stroke; diagnosed with CRPS-type 1 with a VAS pain score > 4 cm.
Exclusion criteria	Intra-articular injection into the affected shoulder during the previous 6 months or use of systemic corticosteroids during the previous 4 months; presence of another explanation of pain; prior surgery to shoulder or neck; serious uncontrolled medical conditions; global aphasia or cognitive impairments; visual impairments which might interfere with the aims of the study; evidence of recent alcohol or drug abuse; or severe depression.
Recruitment / selection of participants	People admitted to their inpatient and outpatient rheaiblitation center after their first episode of unilateral ischaemic or haemorrhagic stroke.
Intervention(s)	Mirror therapy N=24 Participants performed upper extremity movements while looking in the mirror, without additional verbal feedback. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks.
Comparator	Sham therapy N=24 Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks.
Number of participants	48
Duration of follow-up	6 months in total (4 weeks of intervention).

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 24)

Participants performed upper extremity movements while looking in the mirror, without additional verbal feedback. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks.

Sham therapy (N = 24)

Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. 5 days a week, 30 minutes of therapy for the 1st 2 weeks; and 5 days a week, 60 minutes of therapy for the last 2 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 24)	Sham therapy (N = 24)
% Female Sample size	n = 13 ; % = 54.2	n = 13 ; % = 54.2
Mean age (SD) Mean (SD)	57.9 (9.9)	58.8 (9.4)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	18	17
Haemorrhagic	6	7

Characteristic	Mirror therapy (N = 24)	Sham therapy (N = 24)
Nominal		
Time period since stroke (month) Mean (SD)	5.1 (2.5)	4.8 (2.8)
Left Sample size	n = 8 ; % = 33.3	n = 6 ; % = 25
Right Sample size	n = 16 ; % = 66.6	n = 18 ; % = 75

Outcomes

Study timepoints

- Baseline
- 4 week (Post-intervention)
- 6 month

Mirror therapy compared to sham therapy at end of intervention at 6 months - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 24	Mirror therapy, 4 week, N = 24	Mirror therapy, 6 month, N = 24	Sham therapy, Baseline, N = 24	Sham therapy, 4 week, N = 24	Sham therapy, 6 month, N = 24
Upper limb and hand motor function (Wolf Motor	3.5 (1.2)	1.5 (0.7)	1.9 (1.2)	3.6 (0.7)	3.4 (0.9)	4.2 (0.8)

Outcome	Mirror therapy, Baseline, N = 24	Mirror therapy, 4 week, N = 24	Mirror therapy, 6 month, N = 24	Sham therapy, Baseline, N = 24	Sham therapy, 4 week, N = 24	Sham therapy, 6 month, N = 24
Function Test) Range: 0-5. Final values. Mean (SD)						
Pain (VAS mean pain at rest) (cm) Scale range: 0-10. Final value. Mean (SD)	7.6 (1.2)	4.3 (2.5)	4.7 (2.6)	7.5 (1.1)	7.2 (2.2)	8.1 (2)

Upper limb and hand motor function (Wolf Motor Function Test) - Polarity - Lower values are better

Pain (VAS mean pain at rest) - Polarity - Lower values are better

Mirror therapy compared to sham therapy at end of intervention at 6 months - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 24	Mirror therapy, 4 week, N = 24	Mirror therapy, 6 month, N = 24	Sham therapy, Baseline, N = 24	Sham therapy, 4 week, N = 24	Sham therapy, 6 month, N = 24
Dropouts Nominal	NA	2	NA	NA	7	NA

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofinterventionat6months-continuousoutcomes-Upperlimbandhandmotorfunction(WolfMotorFunctionTest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionat6months-continuousoutcomes-Upperlimbandhandmotorfunction(WolfMotorFunctionTest)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionat6months-continuousoutcomes-Pain(VASmeanpainatrest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionat6months-continuousoutcomes-Pain(VASmeanpainatrest)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionat6months-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Cacchio, 2009

Bibliographic Reference	Cacchio, Angelo; De Blasis, Elisabetta; Necozione, Stefano; Orio, Ferdinando di; Santilli, Valter; Mirror therapy for chronic complex regional pain syndrome type 1 and stroke; New England Journal of Medicine; 2009; vol. 361 (no. 6); 634-636

Study details

Secondary publication of another included study- see primary study for details	No additional information.

Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Italy.
Study setting	Inpatient and outpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	1st ischaemic or haemorrhagic stroke (> 6 months); diagnosis of CRPS-type 1 (pain VAS > 4 cm).
Exclusion criteria	Intra-articular shoulder injection in the previous 6 months or systemic corticosteroid in the previous 4 months; another obvious explanation for pain; prior surgery to shoulder or neck region; serious uncontrolled medical conditions; global aphasia or cognitive impairments interfering with understanding instructions, motor testing and treatment; visual impairments interfering with aims of the study; evidence of recent alcohol or drug abuse; or severe depression.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=8 Participants performed cardinal upper extremity movements while looking in the mirror. 5 days a week; 30 minutes of therapy for 4 weeks.
Comparator	Sham therapy N=8 Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. 5 days a week; 30 minutes of therapy for 4 weeks.

	Usual care N=8 Participants performed mental imagery. 5 days a week; 30 minutes of therapy for 4 weeks.
Number of participants	24
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 8)

Participants performed cardinal upper extremity movements while looking in the mirror. 5 days a week; 30 minutes of therapy for 4 weeks.

Sham therapy and usual care (N = 16)

8 Participants performed the same treatment protocol as in group 1 but with covering the reflecting side of the mirror. 5 days a week; 30 minutes of therapy for 4 weeks. 8 Participants performed mental imagery. 5 days a week; 30 minutes of therapy for 4 weeks. Groups were combined in the analysis.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 24)**
% Female Nominal	13
Mean age (SD) Mean (SD)	62 (NR)
Ethnicity Nominal	NR

Characteristic	Study (N = 24)
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	19
Haemorrhagic Nominal	5
Time period since stroke Mean (SD)	15.7 (NR)
Left Nominal	15
Right Nominal	9

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy/usual care at end of intervention (4 weeks) - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 4 week, N = 8	Sham therapy and usual care, Baseline, N = 16	Sham therapy and usual care, 4 week, N = 16
Upper limb and hand motor function (Wolf Motor Function Test) Scale range: 0-5. Final value. Mean (SD)	NR (NR)	2.2 (0.8)	NR (NR)	3.7 (1.2)
Pain (Visual analogue scale) (mm) Scale range: 0-100. Final value. Mean (SD)	NR (NR)	14.8 (4.5)	NR (NR)	75.5 (11.6)

Upper limb and hand motor function (Wolf Motor Function Test) - Polarity - Lower values are better

Pain (Visual analogue scale) - Polarity - Lower values are better

Mirror therapy compared to sham therapy/usual care at end of intervention (4 weeks) - dichotimous outcomes

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 4 week, N = 8	Sham therapy and usual care, Baseline, N = 16	Sham therapy and usual care, 4 week, N = 16
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapy/usualcareatendofintervention(4weeks)-continuousoutcomes-Upperlimbandhandmotorfunction(WolfMotorFunctionTest)-MeanSD-Mirror therapy-Sham therapy and usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapy/usualcareatendofintervention(4weeks)-continuousoutcomes-Pain(Visualanaloguescale)-MeanSD-Mirror therapy-Sham therapy and usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapy/usualcareatendofintervention(4weeks)-dichotimousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy and usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Cha, 2015

Bibliographic Reference	Cha, Hyun Gyu; Kim, Myoung-Kwon; Therapeutic efficacy of low frequency transcranial magnetic stimulation in conjunction with mirror therapy for sub-acute stroke patients; Journal of Magnetics; 2015; vol. 20 (no. 1); 52-56

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Not stated.
Study dates	No stated.
Sources of funding	Not stated.
Inclusion criteria	Stroke onset duration of > 6 months; no neurological deficits in the cerebellum or the brainstem; no hemineglect or visual field deficits; no cognitive problems (> 24 points in the MMSE); independent walking (with or without walking aids).
Exclusion criteria	Not stated.

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=19 Mirror therapy and repetitive transcranial magnetic stimulation (rTMS). Activities with the unaffected limb; flexing and extending the hip, knee, and ankle at a self-selected speed under supervision but without additional verbal feedback; 10 minutes of rest period in the middle of the session; rTMS- 70 mm coil and a Magstim Rapid (Magstim, Wales, UK) 1 Hz rTMS was applied for 20 minutes to the hotspot of the lesional hemisphere in 10-second trains, with 50-second intervals between the trains. 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes MT or sham therapy).
Comparator	Sham therapy N=17 Sham therapy and repetitive transcranial magnetic stimulation (rTMS). Same therapy protocol, except the mirror was covered; rTMS: 70 mm coil and a Magstim Rapid (Magstim, Wales, UK) 1 Hz rTMS was applied for 20 minutes to the hotspot of the lesional hemisphere in 10-second trains, with 50-second intervals between the trains. 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes MT or sham therapy).
Number of participants	36.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 19)

Mirror therapy and repetitive transcranial magnetic stimulation (rTMS). Activities with the unaffected limb; flexing and extending the hip, knee, and ankle at a self-selected speed under supervision but without additional verbal feedback; 10 minutes of rest period in the middle of the session; rTMS- 70 mm coil and a Magstim Rapid (Magstim, Wales, UK) 1 Hz rTMS was applied for 20 minutes to the hotspot of the lesional hemisphere in 10-second trains, with 50-second intervals between the trains. 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes MT or sham therapy).

Sham therapy (N = 17)

Sham therapy and repetitive transcranial magnetic stimulation (rTMS). Same therapy protocol, except the mirror was covered; rTMS: 70 mm coil and a Magstim Rapid (Magstim, Wales, UK) 1 Hz rTMS was applied for 20 minutes to the hotspot of the lesional hemisphere in 10-second trains, with 50-second intervals between the trains. 4 weeks, 5 days a week, 40 minutes (20 minutes rTMS and 20 minutes MT or sham therapy).

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 19)	Sham therapy (N = 17)
% Female Nominal	9	8
Mean age (SD) (years) Mean (SD)	60 (7.8)	57.35 (9.38)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke (month) Mean (SD)	1.95 (0.62)	1.65 (0.86)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to sham therapy at end of intervention (4 weeks) - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 4 week, N = 19	Sham therapy, Baseline, N = 17	Sham therapy, 4 week, N = 17
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Final value. Mean (SD)	40.74 (10.61)	56.7 (11)	42.53 (11.64)	53.1 (9.6)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention(4weeks)-continuousoutcomes-Lowerlimbmotorfunction(BergBalanceScale)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Chan, 2018

Bibliographic Reference	Chan, W. C.; Au-Yeung, S. S. Y.; Recovery in the Severely Impaired Arm Post-Stroke After Mirror Therapy: A Randomized Controlled Study; American Journal of Physical Medicine & Rehabilitation; 2018; vol. 97 (no. 8); 572-577

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	ID NCT02942875
Study location	China
Study setting	stroke rehabilitation unit
Study dates	September 1, 2014, to August 30, 2016
Sources of funding	Financial disclosure statements have been obtained, and no conflicts of interest have been reported by the authors or by any individuals in control of the content of this article.
Inclusion criteria	Older than 35 yrs, experienced first stroke of supertentorial cerebral infarct or hemorrhage within 1 month from the date of onset, and had unilateral weakness of the arm contralateral to the side of stroke, with Motricity Index score less than 57 of 100, which denoted moderate to severe motor impairment in the paretic arm
Exclusion criteria	visual impairment, scored less than 22 in Mini-Mental State Examination,17 presented with aphasia, visual neglect, unable to comprehend instructions, or with history of impairment in either arm before stroke

Recruitment / selection of participants	Patients were screened from those admitted to the regional rehabilitation hospital for stroke rehabilitation by the first author who did not involve in the rehabilitation or assessment of the subjects
Intervention(s)	Subjects sat in front of a table on which a mirror was placed vertically in the space ipsilateral to the paretic arm. The mirror's reflective surface was facing the intact arm. Subjects were required to watch the reflective image of the whole intact arm from shoulder to the hand. They were instructed to practice five structured active movements with the intact arm, in a 30-min session. A total of 120 repetitions were practiced for each of the five arm exercises in one session. Patients received two 30-min arm exercise sessions daily, 5 days a week for 4 consecutive weeks in addition to the usual conventional rehabilitation regime of the hospital. Plus usual care - conventional rehabilitation in the hospital attended by all subjects, the regime included 1.5 hrs physiotherapy, 1-hr occupational therapy daily during the weekdays, and speech therapy/clinical psychology sessions when applicable. Physiotherapy for the paretic arm included positioning, functional electrical stimulation, passive/assisted active exercise on arm ergometers, and strengthening exercise, totally lasting for 30 mins
Comparator	Subjects in the CT group performed the same five structured exercises with both the paretic and intact arm but without a mirror. Two 30-min arm exercise sessions daily, 5 days a week for 4 consecutive weeks in addition to the usual conventional rehabilitation regime of the hospital. Plus usual care - conventional rehabilitation in the hospital attended by all subjects, the regime included 1.5 hrs physiotherapy, 1-hr occupational therapy daily during the weekdays, and speech therapy/clinical psychology sessions when applicable. Physiotherapy for the paretic arm included positioning, functional electrical stimulation, passive/assisted active exercise on arm ergometers, and strengthening exercise, totally lasting for 30 mins
Number of participants	41
Duration of follow-up	post intervention - 4 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 20)

control therapy (N = 21)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 35)**
% Female Nominal	13

Characteristic	Study (N = 35)
Mean age (SD) Mean (SD)	64.6 (12.6)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	27
Time period since stroke (days) Mean (SD)	13.2 (6.7)

Arm-level characteristics

Characteristic	Mirror therapy (N = 20)	control therapy (N = 21)
side of paresis (left) Nominal	10	12

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 15	control therapy, Baseline, N = 21	control therapy, 4 week, N = 20
motor function (Wolf Motor Function Test) (seconds) 0-120 Mean (SD)	92.2 (37.8)	61.7 (44.9)	77.6 (39.2)	49.4 (39.2)
Fugl-Meyer Assessment-Upper Extremity total score 0-66 Mean (SD)	19.2 (16)	34.4 (18.9)	21.7 (15.1)	38 (18.2)
Drop outs Nominal	5	*empty data*	1	*empty data*

motor function (Wolf Motor Function Test) - Polarity - Lower values are better

Fugl-Meyer Assessment-Upper Extremity total score - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-motorfunction(WolfMotorFunctionTest)-MeanSD-Mirror therapy-control therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Fugl-MeyerAssessment-UpperExtremitytotalscore-MeanSD-Mirror therapy-control therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Dropouts-Nominal-Mirror therapy-control therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Chaudhari, 2019

Bibliographic Reference	Chaudhari, R. T.; Devi, S.; Dumbre, D.; Effectiveness of Mirror Therapy on Upper Extremity Functioning among Stroke Patients; Indian journal of physiotherapy & occupational therapy; 2019; vol. 13 (no. 1); 128-132

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India
Study setting	stroke rehabilitation centre
Study dates	14/02/18-15/03/18
Sources of funding	self funded
Inclusion criteria	post stroke patients who received rehabilitation at neuro rehabilitation centres
Exclusion criteria	NR
Recruitment / selection of participants	post stroke patients who received rehabilitation at neuro rehabilitation centres
Intervention(s)	Mirror therapy plus conventional therapy for 3 days per week for 4 weeks.
Comparator	conventional therapy for 3 days per week for 4 weeks.
Number of participants	50

Duration of follow-up	4 weeks
Additional comments	this study was a Quasi experimental pre test post test design however it states that patients were randomly assigned to their treatment groups so we have included but marked down for for risk of bias
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Not stated/unclear
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 25)

conventional therapy (N = 25)

Characteristics

Study-level characteristics

Characteristic	Study (N = 50)
% Female Nominal	NR
Mean age (SD) Nominal	NR
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	mirror therapy, Baseline, N = 25	mirror therapy, 4 week, N = 25	conventional therapy , Baseline, N = 25	conventional therapy , 4 week, N = 25
• **Measures of motor impairment (modified brunnstrom upper extermity)** Mean (SD)	7.6 (1.15)	13.4 (1.8)	8.1 (1.17)	11.7 (1.51)

• Measures of motor impairment (modified brunnstrom upper extermity) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-• Measuresofmotorimpairment(modifiedbrunnstromupperextermity)-MeanSD-mirror therapy-conventional therapy -t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Chinnavan, 2020

Bibliographic Reference	Chinnavan, E.; Priya, Y.; Ragupathy, R.; Wah, Y. C.; Effectiveness of mirror therapy on upper limb motor functions among hemiplegic patients; Bangladesh Journal of Medical Science; 2020; vol. 19 (no. 2); 208-213

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Malaysia
Study setting	private hospitals and physiotherapy centres
Study dates	NR
Sources of funding	NR
Inclusion criteria	Subjects with Right or Left sided hemiplegic with age group between 45 to 65 years of both genders in chronic phase (over six months and above).Scored more than 24 on the Mini-Mental State Examination. Subjects with no previous exposure to mirror therapy and had normal visual perception
Exclusion criteria	Subjects unable to follow visual command, age group below than 45 years and more than 65 years, unilateral neglect, and severe cognitive, or language deficits that could prevent them from following instructions were excluded

Recruitment / selection of participants	Participants were recruited from the outpatients department of Physiotherapy, Malaysia government hospitals, Private hospitals and from private Physiotherapy centres. Screening was done and 25 participants were randomly selected.
Intervention(s)	The mirror is placed in front of the midline of the patient so that the affected limb is fully covered by the mirror and the reflection of the unaffected limb is fully visible. The affected limb positioned in a safe and comfortable position behind the mirror. The non-affected limb should be positioned in a similar position as the affected limb, as this facilitates the intensity of the mirror illusion. Patients in the experimental group received 45 minutes of consecutive session. First 30 minutes therapy consists of conventional therapy as given conventional tasks only with the affected upper extremity. 15 minutes were continued with mirror therapy which tasks only with the unaffected upper extremity. The therapy in the mirror group involved reaching, grasping & dexterity. Patients were asked to make five different movements: (a) pronation and supination of the forearm, (b) flexion and extension of the wrist, (c) flexion and extension of the finger, (d) numbering and opposition. Patients were asked to execute ADL movements for task - oriented purposes (grabbing and releasing balls, using a spray bottle, kneading putty, pinching coins, using a spoon and wiping a towel table). In order to use the unaffected side, these movements were performed and each movement was repeated 10 times and 3 days / week
Comparator	Patients in control group were in seated position with their affected hand on top off table. Patients in the control group received 45 minutes of consecutive session and therapy consisted of performing tasks only with the affected upper extremity for 3days/ week. The therapy in the conventional group involved mobilization, reaching, grasping & dexterity.
Number of participants	25
Duration of follow-up	6 weeks
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 13)

conventional therapy (N = 12)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 25)**
% Female Nominal	7
Mean age (SD) Range	45 to 65
Ethnicity Nominal	NR

Characteristic	Study (N = 25)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR
sideof paresis Left Nominal	14

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	Mirror therapy, Baseline, N = 13	Mirror therapy, 6 week, N = 13	conventional therapy, Baseline, N = 12	conventional therapy, 6 week, N = 12
Fugl Meyer Assessment Upper Extremity (0-66) Mean (SD)	44 (11.85)	51 (12.01)	39.92 (12.65)	42.75 (11.96)
functional independance measure (0 - 100) Mean (SD)	64.38 (14.65)	71.46 (12.82)	59.83 (16.44)	61.58 (16.21)

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

functional independance measure - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-functionalindependancemeasure-MeanSD-Mirror therapy-conventional therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-Mirror therapy-conventional therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Cho, 2015

Bibliographic Reference	Cho, Hyuk-Shin; Cha, Hyun-gyu; Effect of mirror therapy with tDCS on functional recovery of the upper extremity of stroke patients; Journal of physical therapy science; 2015; vol. 27 (no. 4); 1045-1047

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.

Study setting	Not stated.
Study dates	Not stated.
Sources of funding	Wonkwang Health Science University.
Inclusion criteria	Stroke with hemiplegic symptoms, a score of 24 or higher on the MMSE-K, stroke onset more than 6 months earlier.
Exclusion criteria	Orthopaedic or neurological disease history.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=14 Participants performed movements of both upper limbs, 10 sets, 20 repetitions of each motion, 2-minute rest between sets. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes mirror therapy.
Comparator	Sham therapy N=13 Participants performed the same exercises with non-reflective surface between limbs. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes sham therapy.
Number of participants	27
Duration of follow-up	6 weeks (end of intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 14)

Participants performed movements of both upper limbs, 10 sets, 20 repetitions of each motion, 2-minute rest between sets. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes mirror therapy

Sham therapy (N = 13)

Participants performed the same exercises with non-reflective surface between limbs. 6 weeks, 3 days a week, 20 minutes of transcranial direct current stimulation + 5 minutes rest + 20 minutes sham therapy.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 13)
% Female Nominal	6	6
Mean age (SD) Mean (SD)	58.29 (10.67)	60.38 (10.19)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	9	8
Haemorrhage Nominal	5	5
Time period since stroke (month) Mean (SD)	13.2 (5.1)	15.5 (7.8)

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 13)
Left Nominal	8	6
Right Nominal	6	7

Outcomes

Study timepoints

- Baseline
- 6 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention (6 weeks) - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 6 week, N = 14	Sham therapy, Baseline, N = 13	Sham therapy, 6 week, N = 13
Upper limb and hand motor function (Box and block test) (Unit) Final value. Mean (SD)	25.29 (11.81)	37.21 (9.62)	23 (9.16)	25.62 (9.03)
Fugl-Meyer Upper Extremity motor Scale range: 0-66. Final value. Mean (SD)	36.5 (11.04)	45.57 (8.76)	39.15 (9)	41.85 (15.78)

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 6 week, N = 14	Sham therapy, Baseline, N = 13	Sham therapy, 6 week, N = 13
Measures of motor impairment (Grip strength) (kg) Final value Mean (SD)	12 (3.53)	15.29 (2.16)	9.92 (3.38)	12.31 (2.72)

Upper limb and hand motor function (Box and block test) - Polarity - Higher values are better

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Measures of motor impairment (Grip strength) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention(6weeks)-continuousoutcomes-Upperlimbandhandmotorfunction(Boxandblocktest)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(6weeks)-continuousoutcomes-FuglMeyerUpperExtremitymotor-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention(6weeks)-continuousoutcomes-Measuresofmotorimpairment(Gripstrength)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Choi, 2019

Bibliographic Reference	Choi, H. S.; Shin, W. S.; Bang, D. H.; Mirror Therapy Using Gesture Recognition for Upper Limb Function, Neck Discomfort, and Quality of Life After Chronic Stroke: A Single-Blind Randomized Controlled Trial; Medical Science Monitor; 2019; vol. 25; 3271-3278

Study details

Secondary publication of another included	NR

study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	South Korea
Study setting	rehabilitation centre
Study dates	NR
Sources of funding	NR
Inclusion criteria	The inclusion criteria of the subjects were as follows: 1) event occurred >6 months previously; 2) sufficient cognition to participate in the training, which was defined as a Mini-Mental State Exam (MMSE) [18] scores of 24 or higher; 3) frequency score of the upper extremity of the motor activity log <2.5, and; 4) no visual impairment and field defect.
Exclusion criteria	The exclusion criteria of the subject were as follows: 1) other neurological problems or orthopaedic injuries; 2) aphasia that makes intervention difficult; 3) recent participation in other rehabilitation research or drug experiment; and 4) research participation rate <80%.
Recruitment / selection of participants	Thirty-six stroke patients who had been admitted to a rehabilitation clinic in the Republic of Korea were randomised
Intervention(s)	All 3 groups underwent traditional physical therapy, including motor learning and neurodevelopmental treatment. Each participant underwent a training program consisting of 15 sessions, 30 min per day, 3 days per week, for 5 weeks. After 5 weeks, the final assessments were performed.

	The GR mirror therapy group used a Leap motion controller (Leap Motion, Inc., USA), a monitor, a mirror, and a Leap Motion App Home. The Leap motion controller is a device with a camera that detects motion. It can recognize 2 hands and 10 fingers with a 0.01 mm precision and a 200 frames/s speed. Game programs include actions, such as recognizing a hand, building a block on a moving object, picking up a petal, removing a block, pushing a block by hand, and lifting a hand. The subject sits in a chair without a backrest while looking at the flat mirror in the 45° direction, and the box is covered with the invisible hand. Subsequently, turning the monitor in the 90° direction, the subject can see the mirrored monitor to see the left and right reversed monitor screen. Subjects looked at the left and right screen of the monitor, and moved the right hand on the Leap motion controller to randomly play the game based on the subject's choice. Each game program was performed for approximately 4 min, and the subject rested for approximately 1 min after the game program was finished. The conventional mirror therapy group underwent training using the general mirror therapy method in which the patient sits on a chair without a backrest and mirror side is placed on the centre line of the patient on the table. The affected hand was placed in the mirror box so that the hand could not be seen, and the non-affected hand was placed in front of the mirror side to reflect the shape of the hand on the mirror. The mirror therapy program consists of 10 movements. Three sets of these programs were performed, and 12 operations were performed per set
Comparator	All 3 groups underwent traditional physical therapy, including motor learning and neurodevelopmental treatment. Each participant underwent a training program consisting of 15 sessions, 30 min per day, 3 days per week, for 5 weeks. After 5 weeks, the final assessments were performed. In the control group, patients underwent sham therapy in the same environment as the mirror therapy group so as not to see the affected hands. All 3 therapy programs included 9 movements: lifting the arms, moving the arms to the left and right, bending and stretching the elbows, raising and lowering the hands, lifting the wrists, lowering the wrists, flexing the wrists inward, flexing the wrist, and finger gripping.
Number of participants	36

Duration of follow-up	5 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

conventional mirror therapy (N = 12)

Gesture recognition mirror therapy group (N = 12)

control group (N = 12)

Characteristics

Study-level characteristics

Characteristic	Study (N = 36)
% Female Nominal	13
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	conventional mirror therapy (N = 12)	Gesture recognition mirror therapy group (N = 12)	control group (N = 12)
Mean age (SD) Mean (SD)	59.58 (11.87)	58 (15.15)	59.33 (13.63)
Type of stroke Ischaemic	NR	NR	NR

Characteristic	conventional mirror therapy (N = 12)	Gesture recognition mirror therapy group (N = 12)	control group (N = 12)
Nominal			
Side of paresis (Left) Nominal	7	8	7

Outcomes

Study timepoints

- Baseline
- 5 week

5 week outcomes

Outcome	conventional mirror therapy, Baseline, N = 12	conventional mirror therapy, 5 week, N = 12	Gesture recognition mirror therapy group, Baseline, N = 12	Gesture recognition mirror therapy group, 5 week, N = 12	control group, Baseline, N = 12	control group, 5 week, N = 12
Upper limb and hand motor function (Manual function test) 0-38 Mean (SD)	9.5 (2.15)	12.33 (2.02)	8.92 (2.54)	13.42 (2.5)	9 (1.95)	10.08 (1.93)
Quality of life (short form 8)	39 (13.96)	42 (11.68)	38.23 (9.96)	42.6 (8.67)	37.39 (6.17)	37.45 (6.62)

Outcome	conventional mirror therapy, Baseline, N = 12	conventional mirror therapy, 5 week, N = 12	Gesture recognition mirror therapy group, Baseline, N = 12	Gesture recognition mirror therapy group, 5 week, N = 12	control group, Baseline, N = 12	control group, 5 week, N = 12
Mean (SD)						

Upper limb and hand motor function (Manual function test) - Polarity - Higher values are better

Quality of life (short form 8) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

5weekoutcomes-Upperlimbandhandmotorfunction(Manualfunctiontest)-MeanSD-conventional mirror therapy-Gesture recognition mirror therapy group-control group-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to not reporting drop outs and unblinded assessors)*
Overall bias and Directness	Overall Directness	Partially applicable *(combining gesture recognition virtual MT with conventional MT to match what Cochrane have done)*

5weekoutcomes-Qualityoflife(shortform8)-MeanSD-conventional mirror therapy-Gesture recognition mirror therapy group-control group-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to not reporting drop outs and unblinded assessors)*
Overall bias and Directness	Overall Directness	Partially applicable *(combining gesture recognition virtual MT with conventional MT to match what Cochrane have done)*

Colomer, 2016

Bibliographic Reference	Colomer, Carolina; Noe, Enrique; Llorens Rodríguez, Roberto; Mirror therapy in chronic stroke survivors with severely impaired upper limb function: a randomized controlled trial; European journal of physical and rehabilitation medicine; 2016; vol. 52 (no. 3); 271-278

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Spain.

Study setting	Outpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Stroke > 6 months, BRS 1 or 2, FM-UE < 19, sensory impairment assessed by clinical examination, able to maintain sitting position for at least 60 minutes, MMSE > 23
Exclusion criteria	Impaired comprehension that hindered understanding of instructions (Mississippi Aphasia screening < 45), upper limb pain that limited participation in rehabilitation protocol, spatial neglect, self-awareness disorder, emotional circumstances that impeded adequate collaboration
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=17 Participants observed their unaffected upper limb in mirror while performing movements with less affected upper limb: flexion-extension of shoulder, pronation and supination of forearm, fine and gross motor tasks with and without objects (balls, cups) and usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of mirror therapy.
Comparator	Usual care N=16 Usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of passive mobilisation.
Number of participants	33.
Duration of follow-up	8 weeks (after intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	Type of stroke: Mixture of ischaemic and haemorrhagic - see participant characteristics table.

Study arms

Mirror therapy (N = 17)

Participants observed their unaffected upper limb in mirror while performing movements with less affected upper limb: flexion-extension of shoulder, pronation and supination of forearm, fine and gross motor tasks with and without objects (balls, cups) and usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of mirror therapy.

Usual care (N = 16)

Usual physical therapy. 8 weeks, 5 days a week, 60 minutes each, additional 3 days a week, 45 minutes a session of passive mobilisation.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 17)	Usual care (N = 16)
% Female Nominal	2	3
Mean age (SD) Mean (SD)	53.8 (5.5)	53.3 (10.5)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	10	13
Haemorrhagic Nominal	5	3
Time period since stroke (days) Mean (SD)	584.2 (478.7)	520 (262.5)

Characteristic	Mirror therapy (N = 17)	Usual care (N = 16)
Left Nominal	10	14
Right Nominal	5	3

Outcomes

Study timepoints

- Baseline
- 8 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 8 week, N = 15	Usual care, Baseline, N = 17	Usual care, 8 week, N = 16
Fugl Meyer Assessment Upper Extremity Scale range unclear. Final value. Mean (SD)	8.5 (1.2)	8.6 (1.1)	9 (1.1)	9.5 (1.1)
Upper limb and hand motor function (Wolf Motor Function Ability) Scale range: 0-30 (0-5 for each question). Final value. Mean (SD)	8.7 (1.7)	10.1 (1.8)	10.9 (1.7)	12.6 (1.8)

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

Upper limb and hand motor function (Wolf Motor Function Ability) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - Dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 17	Mirror therapy, 8 week, N = 17	Usual care, Baseline, N = 17	Usual care, 8 week, N = 17
Dropouts Nominal	NR	2	NR	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-Continuousoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-Continuousoutcomes-Upperlimbandhandmotorfunction(WolfMotorFunctionAbility)-MeanSD-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-Dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Cristina, 2015

Bibliographic Reference	Cristina, Luca Mirela; Matei, Daniela; Ignat, Bogdan; Popescu, Cristian Dinu; Mirror therapy enhances upper extremity motor recovery in stroke patients; Acta neurologica belgica; 2015; vol. 115 (no. 4); 597-603

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Romania.
Study setting	Inpatient.
Study dates	Not stated.
Sources of funding	Not financed.
Inclusion criteria	Hemiplegia following a 1st stroke (documented by CT scan), time from stroke between 1 to 3 months, without severe attention deficit
Exclusion criteria	Global aphasia and cognitive impairments that might interfere with understanding instructions for testing, concomitant progressive central or peripheral nervous system disorders
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=7 Mirror therapy - bilateral (as good as possible) upper limb movements (flexion and extension of the shoulder, elbow, wrist and finger, pronation and supination of the forearm) under physiotherapeutic supervision. Conventional stroke rehabilitation programme (neuro-rehabilitation technique, electrical stimulation and occupational therapy). 30 minutes of mirror therapy with 6 weeks, 5 times a week, 30 minutes a session conventional stroke rehabilitation programme.
Comparator	Usual care N=8 Conventional stroke rehabilitation programme (neuro-rehabilitation technique, electrical stimulation and occupational therapy). 6 weeks, 5 times a week, 30 minutes a session conventional stroke rehabilitation programme.
Number of participants	15.
Duration of follow-up	6 weeks and 1 day (1 day after therapy)

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 7)

Mirror therapy - bilateral (as good as possible) upper limb movements (flexion and extension of the shoulder, elbow, wrist and finger, pronation and supination of the forearm) under physiotherapeutic supervision. Conventional stroke rehabilitation programme (neuro-rehabilitation technique, electrical stimulation and occupational therapy). 30 minutes of mirror therapy with 6 weeks, 5 times a week, 30 minutes a session conventional stroke rehabilitation programme.

Usual care (N = 8)

Conventional stroke rehabilitation programme (neuro-rehabilitation technique, electrical stimulation and occupational therapy). 6 weeks, 5 times a week, 30 minutes a session conventional stroke rehabilitation programme.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 7)	Usual care (N = 8)
% Female Nominal	4	4
Mean age (SD) Mean (SD)	58.2 (7.2)	56.8 (8.3)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke (days)	54.3 (7.9)	52.2 (12.7)

Characteristic	Mirror therapy (N = 7)	Usual care (N = 8)
Mean (SD)		
Left Nominal	2	3
Right Nominal	5	5

Outcomes

Study timepoints

- Baseline
- 6 week (End of intervention)

Mirror therapy compared to usual care at end of intervention (6 weeks) - continuous outcome

Outcome	Mirror therapy, Baseline, N = 7	Mirror therapy, 6 week, N = 7	Usual care, Baseline, N = 8	Usual care, 6 week, N = 8
Fugl-Meyer Upper Extremity motor Scale range: 0-66. Final value. Mean (SD)	34.1 (8.4)	46.5 (7.5)	38.6 (6.2)	47.3 (6.3)

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention(6weeks)-continuousoutcome-FuglMeyerUpperExtremitymotor-MeanSD-Mirror therapy-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Cui, 2022

Bibliographic Reference	Cui, W; Huang, L; Tian, Y; Luo, H; Chen, S; Yang, Y; Li, Y; Fu, J; Yu, Q; Xu, L; Effect and mechanism of mirror therapy on lower limb rehabilitation after ischemic stroke: a fMRI study; NeuroRehabilitation; 2022; 65-77

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Outpatient follow up.
Study dates	March 2016 to June 2017
Sources of funding	This work is financially supported by Sichuan Province Pharmaceutical Administration (Grant No. 2014B064), the Key R&D Program of Sichuan Province (No.2020YFS0415).
Inclusion criteria	People who experienced a first-ever ischaemic stroke with lesions limited to one hemisphere, and the symptoms met the diagnostic criteria stated in the "Guidelines for the diagnostics and treatment of acute ischaemic stroke in China" set by the Neurology Subcommittee of the Chinese Medical Association in 2014. All people were diagnosed with ischaemic stroke by head CT or MRI; people were in stable conditions, when the people were enrolled in the study, they were within 30 days from the onset of ischaemic stroke; people exhibited hemiplegia; modified Ashworth scale for lower extremity was not higher than 2; Brunnstrom score for the lower extremity was between I and IV; people showed no cognitive impairment that would affect their ability to cooperate with their treatment. Their Mini Mental State Examination score was greater than 23; people could keep static balance in the sitting position; people were right handed.
Exclusion criteria	People showed unstable vital signs; people had a history of cerebrovascular diseases with sequelae that impaired neural or motor functions; people had a history of epilepsy, dementia, depression or other conditions that may compromise the brain function; people had psychological conditions, cognitive impairment and other medical conditions that would affect the patients' ability act within the study protocol; people had metal implants or other medical conditions that are unsuitable for MRI examination; people had impaired vision.
Recruitment / selection of participants	32 patients with ischemic stroke who were treated at the Department of Rehabilitation of Sichuan Provincial People's Hospital from March 2016 to June 2017 were recruited and randomly divided into the control group (CT) and the mirror therapy group (MT) with 16 patients in each group.
Intervention(s)	Mirror therapy N=16 Mirror therapy 5 times a week for 30 minutes each time over 3 weeks in addition to usual care. This was provided in a quiet environment. People were seated in a stable chair with a mirror of 85cm x 189cm placed in front of them in the sagittal plane. Their legs were located on either side of the mirror. The non-paretic limb was placed on the reflective side. People were asked to perform the instructions with both limbs, but to view the image of the non-paretic limb and image that this is

	what the affected side is moving as. If the limb is not able to actively move, the therapist could assist the movement behind the mirror. People were asked to complete five sets of the movement, including both internal and external rotation of the hip joint, dorsiflexion and plantar flexion of the ankle joint and varus and valgus of the ankle joint, with each movement reaching the maximum range of the joint motion. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.
Comparator	Usual care N=16 Usual care only. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.
Number of participants	32
Duration of follow-up	3 weeks
Additional comments	No additional information
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 16)

Mirror therapy 5 times a week for 30 minutes each time over 3 weeks in addition to usual care. This was provided in a quiet environment. People were seated in a stable chair with a mirror of 85cm x 189cm placed in front of them in the sagittal plane. Their legs were located on either side of the mirror. The non-paretic limb was placed on the reflective side. People were asked to perform the instructions with both limbs, but to view the image of the non-paretic limb and image that this is what the affected side is moving as. If the limb is not able to actively move, the therapist could assist the movement behind the mirror. People were asked to complete five sets of the movement, including both internal and external rotation of the hip joint, dorsiflexion and plantar flexion of the ankle joint and varus and valgus of the ankle joint, with each movement reaching the maximum range of the joint motion. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.

Usual care (N = 16)

Usual care only. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 16)	Usual care (N = 16)
% Female Sample size	n = 7 ; % = 43.8	n = 5 ; % = 50
Mean age (SD) (years) Mean (SD)	61.5 (9.93)	58.5 (11.15)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Mirror therapy (N = 16)	Usual care (N = 16)
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	21.38 (5.19)	20 (4.42)

Outcomes

Study timepoints

- Baseline
- 3 week (End of the intervention)

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 3 week, N = 16	Usual care, Baseline, N = 16	Usual care, 3 week, N = 16
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Change scores. Reporting of results is unclear (results for mean change appear to the be the same as those for the control group pre-treatment and post-treatment). Mean (SD)	NR (NR)	21.75 (10.46)	NR (NR)	10.69 (8.62)

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 3 week, N = 16	Usual care, Baseline, N = 16	Usual care, 3 week, N = 16
Measures of motor impairment - Lower limb (Fugl Meyer Assessment - Lower Extremity) Scale range: 0-34. Final values. Mean (SD)	10.06 (6.64)	22.44 (6.51)	11.31 (6.37)	17.94 (5.74)
Activities of daily living (Modified Barthel Index) Scale range: 0-100. Change scores. Mean (SD)	20.5 (8.78)	43.75 (14.25)	NR (NR)	20.25 (12.22)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Measures of motor impairment - Lower limb (Fugl Meyer Assessment - Lower Extremity) - Polarity - Higher values are better

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better

Dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 3 week, N = 16	Usual care, Baseline, N = 16	Usual care, 3 week, N = 16
Dropout rate reasons - intervention = 2 discharged, 1 lack of time, control = 1 thrombosis, 2 discharged, 1 not willing to have FMRI No of events	n = NA ; % = NA	n = 3 ; % = 15.8	n = NA ; % = NA	n = 4 ; % = 20

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Lowerlimbmotorfunction(BergBalanceScale)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Measuresofmotorimpairment-Lowerlimb(FuglMeyerAssessment-LowerExtremity)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Activitiesofdailyliving(ModifiedBarthelIndex)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dalla Libera, 2015

Bibliographic Reference	Dalla Libera, D; Regazzi, S; Fasoletti, C; Ruggieri, D Dinacci; Rossi, P; Beneficial effect of transcranic magnetic stimulation combined with mirror therapy in stroke patients: a pilot study in neurorehabilitative setting; Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation; 2015; vol. 8 (no. 2); 377

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)

Study location	Switzerland.
Study setting	Not stated.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	3 months after stroke; severe disability (NIHSS 10 - 14), hand paresis.
Exclusion criteria	Not stated.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=5 Transcranial magnetic stimulation with mirror therapy. 15 minutes of mirror therapy. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes.
Comparator	Usual care N=5 Transcranial magnetic stimulation. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes.
Number of participants	10.
Duration of follow-up	4 weeks.
Additional comments	This study information was extracted from the Cochrane review. This study is a conference abstract and doesn't report the results of any outcomes. States that the following outcomes were recorded:

	MRC Scale for Muscle Strength BRS FM-UE FAB Beck Depression Scale 10-item Spiegelberger Trait Anger Scale MoCA Functional Independence Measure (FIM)
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 5)

Transcranial magnetic stimulation with mirror therapy. 15 minutes of mirror therapy. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes.

Usual care (N = 5)

Transcranial magnetic stimulation. Double-pulse TMS through a figure-eight focal coil for bilateral intracortical inhibition in primary motor at rest and during movement preparation 4 weeks, 3 days a week, 15 minutes.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 10)**
% Female Nominal	NR
Mean age (SD) Nominal	NR
Ethnicity Nominal	NR

Characteristic	Study (N = 10)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

De, 2017

Bibliographic Reference	De, Suvadeep; Chopra, Charu; Mehta Daksha, Mehta; Mehndiratta, M. M.; Comparison between Mirror Therapy and Mental Imagery in Improving Ankle Motor Recovery in Sub Acute Stroke Patients; Indian journal of physiotherapy & occupational therapy; 2017; vol. 11 (no. 3); 169-172

Study details

Secondary publication of another included	NR

study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India
Study setting	NR
Study dates	NR
Sources of funding	the institute has Balance trainer and BMI Analyser in research labs. Except for this it was a self financed study
Inclusion criteria	first unilateral stroke confined to the middle cerebral artery with hemiparesis, 3-12 months post stroke, age 50-65 years, brunnstrom recovery stage 2 or more. Patients with no severe cognitive deficit i.e. mini mental state examination score >24, ability to walk with supervision and/or with aids > 10 meters, able to understand and follow verbal instruction were included in the study.
Exclusion criteria	patients with unilateral neglect, with apraxia, impaired vison or aphasia, any psychiatric disorder, any neurological, musculoskeletal, cardiopulmonary disorder were excluded.
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy - 30 mins plus 30 mins of additional conventional therapy which included neurodevelopmental facilitation technique, stretching, gait training that is a total of 1 hour per day for 5 days a week for 4 weeks. Both therapies consisted of ankle dorsiflexion and ankle eversion.
Comparator	mental imagery - 30 mins plus 30 mins of additional conventional therapy which included neurodevelopmental facilitation technique, stretching, gait training that is a total of 1 hour per day for 5 days a week for 4 weeks. Both therapies consisted of ankle dorsiflexion and ankle eversion.

Number of participants	30
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

mirror therapy (N = 15)

mental imagery (N = 15)

Characteristics

Study-level characteristics

Characteristic	Study (N = 30)
% Female Nominal	NR
Mean age (SD) Range	50 to 65
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke (Months) Range	3 to 12

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	mirror therapy, Baseline, N = 15	mirror therapy, 4 week, N = 15	mental imagery , Baseline, N = 15	mental imagery , 4 week, N = 15
Measures of motor impairment -Fugel meyer assessment lower extremity 0-34. Reports final values and a p value for the between group difference (0.178). Mean (p value)	NR (NR)	21.33 (0.18)	NR (NR)	22.4 (0.18)

Measures of motor impairment -Fugel meyer assessment lower extremity - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Measuresofmotorimpairment-Fugelmeyerassessmentlowerextremity-MeanPValue-mirror therapy-mental imagery -t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Ding, 2019

Bibliographic Reference	Ding, L.; Wang, X.; Chen, S.; Wang, H.; Tian, J.; Rong, J.; Shao, P.; Tong, S.; Guo, X.; Jia, J.; Camera-Based Mirror Visual Input for Priming Promotes Motor Recovery, Daily Function, and Brain Network Segregation in Subacute Stroke Patients; Neurorehabilitation & Neural Repair; 2019; vol. 33 (no. 4); 307-318

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	ChiCTR1800015674.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	This project was supported in part by the National Key R&D Program of China (2018YFC2002300 and 2018YFC2002301) and the National Natural Science Foundation of China (No. 61771313).
Inclusion criteria	Computer tomography or MRI confirmed unilateral ischaemic stroke for the first time; between 1 to 6 months after onset; aged 25 to 75 years; the Brunnstrom stages ranging from I to V in the proximal and distal part.

Exclusion criteria	Severe cognitive disorder (mini-mental stage examination score <23); psychiatric disorder; aphasia; severe spasticity in any joints of the affected upper limb (modified Ashworth scale >2).
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Camera technique-based mirror visual feedback (instead of using a real mirror). It was a prism shape (1200 mm x 940 mm x 702 mm) with a height adjustable platform with a 23.8-inch LED screen fixed on one face to provide visual feedback. Two cameras were mounted on the lateral edge of the prism to capture the movements of the hands, wrists and forearms. During the training, the pictures of the unaffected hand and its mirror image were shown on the screen in front of the people. A training procedure was used which entailed 2 sections: 1) simple motor training, which contained gross and fine motor tasks, including grasping, finger opposition, pinching, wrist extension/flexion, forearm supination/pronation and so on; 2) task-based motor training, where texture-varying objects like a glass, wooden blocks, tennis ball and duster were used to provide task-based training, including specific reaching or placing tasks. Furthermore, video-guided motor training and verbal instruction were employed for systematic procedure. The people in the group received 1 hour of mirror therapy prior to the 30-minute task-based training. An experienced therapist helped the person to relax using stretching technique before training. Five out of the 8 prespecified tasks were chosen by the therapy. Each task would repeat 30 times per session for two sessions. After priming, the therapist would administrate stretching and massage to help the person to relax again. Subsequently, task-based trainings on hand function, which varied depending on the chosen motor tasks, were provided by the therapist for half an hour. Concomitant therapy: All people received 1.5 hours of training per day in addition to their routine rehabilitation in hospital, 5 days per week for 4 weeks.
Comparator	Usual care N=10 1.5 hour dosage-equivalent (intensity and duration) rehabilitation therapies as the mirror group. Exercise prescription of the control group was in accord with the mirror group, including repetitive passive/active motor tasks and task-based motor training without mirror visual feedback (1 hour, 5 out of 8 prespecified tasks), stretching/massage before and after the training and subsequent task-based training on hand function (30 minutes).

	Concomitant therapy: No additional information.
Number of participants	20
Duration of follow-up	4 weeks
Additional comments	No additional information (appears to be completers only included in the analysis).
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 10)

Camera technique-based mirror visual feedback (instead of using a real mirror). It was a prism shape (1200 mm x 940 mm x 702 mm) with a height adjustable platform with a 23.8-inch LED screen fixed on one face to provide visual feedback. Two cameras were mounted on the lateral edge of the prism to capture the movements of the hands, wrists and forearms. During the training, the pictures of the unaffected hand and its mirror image were shown on the screen in front of the people. A training procedure was used which entailed 2 sections: 1) simple motor training, which contained gross and fine motor tasks, including grasping, finger opposition, pinching, wrist extension/flexion, forearm supination/pronation and so on; 2) task-based motor training, where texture-varying objects like a glass, wooden blocks, tennis ball and duster were used to provide task-based training, including specific reaching or placing tasks. Furthermore, video-guided motor training and verbal instruction were employed for systematic procedure. The people in the group received 1 hour of mirror therapy prior to the 30-minute task-based training. An experienced therapist helped the person to relax using stretching technique before training. Five out of the 8 prespecified tasks were chosen by the therapy. Each task would repeat 30 times per session for two sessions. After priming, the therapist would administrate stretching and massage to help the person to relax again. Subsequently, task-based trainings on hand function, which varied depending on the chosen motor tasks, were provided by the therapist for half an hour. Concomitant therapy: All people received 1.5 hours of training per day in addition to their routine rehabilitation in hospital, 5 days per week for 4 weeks.

Usual care (N = 10)

1.5 hour dosage-equivalent (intensity and duration) rehabilitation therapies as the mirror group. Exercise prescription of the control group was in accord with the mirror group, including repetitive passive/active motor tasks and task-based motor training without mirror visual feedback (1 hour, 5 out of 8 prespecified tasks), stretching/massage before and after the training and subsequent task-based training on hand function (30 minutes). Concomitant therapy: All people received 1.5 hours of training per day in addition to their routine rehabilitation in hospital, 5 days per week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 10)	Usual care (N = 10)
% Female Sample size	n = 0 ; % = 0	n = 3 ; % = 30
Mean age (SD) (years) Mean (SD)	57.3 (12.98)	59.3 (13.36)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	72 (28.71)	72.9 (43.45)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	32 (20.26)	44.6 (12.82)	19.6 (19.3)	26.4 (19.31)
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Final values. Mean (SD)	28.7 (13.12)	45.7 (14.81)	21.8 (16.86)	30.4 (16.17)
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	88.2 (34.15)	105.3 (22.31)	76.5 (26.33)	82.7 (25.49)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Activities of daily living (functional independence measure) - Polarity - Higher values are better

Dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
Dropout rate Intervention group: 1 excluded from EEG recording for scheduling conflicts. No of events	n = NA ; % = NA	n = 1 ; % = 10	n = NA ; % = NA	n = 0 ; % = 0

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Lowerlimbmotorfunction(BergBalanceScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dohle, 2009

Bibliographic Reference	Dohle, Christian; Püllen, Judith; Nakaten, Antje; Küst, Jutta; Rietz, Christian; Karbe, Hans; Mirror therapy promotes recovery from severe hemiparesis: a randomized controlled trial; Neurorehabilitation and neural repair; 2009; vol. 23 (no. 3); 209-217

Study details

Secondary publication of another included study- see primary study for details	NR

Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Germany
Study setting	inpatient rehabilitation centre
Study dates	October 2004 - April 2006
Sources of funding	Rehabilitation research network (refonet) of the German Pension Scheme Rhineland
Inclusion criteria	First-ever ischaemic stroke in the territory of the middle cerebral artery; not more than 8 weeks post-stroke; between 25 and 80 years old; able to follow therapy instructions; capable of participating in 30-minute daily therapy sessions
Exclusion criteria	Experienced previous stroke; major haemorrhagic changes; increased intracranial pressure; hemicraniectomy or orthopaedic, rheumatologic, or other diseases interfering with their ability to sit or to move either upper limb
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: participants were instructed to move both arms "as well as possible" while looking in the mirror. 5 days a week; 30 minutes of therapy for 6 weeks
Comparator	Bilateral arm training: participants performed the same treatment protocol as in group 1 but without a mirror 5 days a week; 30 minutes of therapy for 6 weeks
Number of participants	48
Duration of follow-up	Post intervention (6 weeks)

Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	ischaemic stroke

Study arms

Mirror therapy (N = 24)

MT: participants were instructed to move both arms "as well as possible" while looking in the mirror

Bilateral arm training (N = 24)

Bilateral arm training: participants performed the same treatment protocol as in group 1 but without a mirror

Characteristics

Study-level characteristics

Characteristic	Study (N =)
% Female Nominal	26
Mean age (SD) Mean (SD)	56.5 (NR)
Type of stroke ischaemic Nominal	48
Ischaemic stroke Nominal	100
Time period since stroke (days) Mean (SD)	27 (NR)
side affected Left side Nominal	25

Outcomes

Study timepoints

- 6 week

6 week outcomes

Outcome	Mirror therapy, 6 week, N = 18	Bilateral arm training, 6 week, N = 18
Motor function (FM-UE) ROM, pain and sensory section 0-126 Mean (SD)	13.4 (3.2)	12.7 (3.3)
ADL (functional independance measure) Mean (SD)	66.6 (9.4)	60.8 (13)
Visuospatial neglect Scale range unclear. Taken from Cochrane review (?from unpublished data). Mean (SD)	48.1 (9.3)	31.2 (9.2)
Pain (Fugl Meyer Pain Subscale) Scale range: 0-2. Final value. Mean (SD)	1.7 (0.2)	1.7 (0.2)

Motor function (FM-UE) ROM, pain and sensory section - Polarity - Higher values are better

Pain (Fugl Meyer Pain Subscale) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, 6 week, N = 24	Bilateral arm training, 6 week, N = 24
Dropouts Nominal	6	6

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-Motorfunction(FM-UE)ROM,painandsensorysection-MeanSD-Mirror therapy-Bilateral arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to attrition bias and detection)*
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-ADL(functionalindependancemeasure)-MeanSD-Mirror therapy-Bilateral arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to attrition bias and detection)*
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-VisuospatialNeglect-MeanSD-Mirror therapy-Bilateral arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to attrition bias and detection)*
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-Pain(FuglMeyerPainSubscale)-MeanSD-Mirror therapy-Bilateral arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to attrition bias and detection)*
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Bilateral arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to attrition bias and detection)*
Overall bias and Directness	Overall Directness	Directly applicable

Ehrensberger, 2019

Bibliographic Reference	Ehrensberger, M.; Simpson, D.; Broderick, P.; Blake, C.; Horgan, F.; Hickey, P.; O'Reilly, J.; Monaghan, K.; Unilateral Strength Training and Mirror Therapy in Patients With Chronic Stroke: A Pilot Randomized Trial; American Journal of Physical Medicine & Rehabilitation; 2019; vol. 98 (no. 8); 657-665

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	NCT 03500705.
Study type	Randomised controlled trial (RCT)
Study location	Ireland.
Study setting	Home-based.
Study dates	November 2015-May 2017.
Sources of funding	ME was supported by the Institute of Technology Sligo President's Bursary Fund and Irish Research Council Postgraduate Scholarship (GOIPG/2016/1662). DS was supported by Institutes of Technology Ireland Postgraduate Research Scholarship and Institute of Technology Sligo Capacity Building Fund.
Inclusion criteria	Older than 18 years; more than 6 months poststroke; discharged from formal rehabilitation; no diagnosis of additional neurological, musculoskeletal or cardiovascular illness that would prevent maximal isometric ST.
Exclusion criteria	Impaired cognition that would affect the ability to make informed consent (Mini Mental State Examination <21); visual impairments.
Recruitment / selection of participants	People referred by rehabilitation professioanls in Sligo and South Donegal.

Intervention(s)	Mirror therapy N=18 Mirror therapy and strength training three times a week for 4 weeks (12 sessions) under constant supervision of two exercise therapists
Comparator	Usual care N=17 Strength training only three times a week for 4 weeks.
Number of participants	35.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 18)

Mirror therapy and strength training three times a week for 4 weeks (12 sessions) under constant supervision of two exercise therapists

Usual care (N = 17)

Strength training only three times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
% Female Nominal	7	4
Mean age (SD) Mean (SD)	61.12 (14.94)	63.53 (11.97)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
Severity Nominal	NR	NR
Ischaemic Nominal	12	9
Haemorrhagic Nominal	5	6
Time period since stroke (Months) Mean (SD)	74.76 (74.58)	90.07 (83.33)
Left Nominal	10	7
Right Nominal	7	8

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 4 week, N = 18	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17
Upper limb motor function (Chedoke Arm and Hand Activity Inventory Version 8) Scale range: 0-56. Final value. Mean (SD)	34.53 (21.64)	38.06 (22.17)	34.57 (21.86)	36.71 (21.47)
Activities of daily living (ABILHAND) Scale range: 0-100. Final value. Mean (SD)	59.7 (16.29)	59.53 (16.46)	57.22 (13.82)	59.85 (16.93)
Stroke-specific Patient Reported Outcome Measures (London Handicap Scale) Scale range: 0-1?. Final value. Mean (SD)	0.43 (0.23)	0.5 (0.21)	0.52 (0.23)	0.53 (0.27)

Upper limb motor function (Chedoke Arm and Hand Activity Inventory Version 8) - Polarity - Higher values are better

Activities of daily living (ABILHAND) - Polarity - Higher values are better

Stroke-specific Patient Reported Outcome Measures (London Handicap Scale) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 4 week, N = 18	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17
Dropouts Intervention: 1 (due to fall unrelated to intervention). Control: 1 due to geographical challenges, 1 due to illness unrelated to intervention.	NA	1	NA	2

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 4 week, N = 18	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17
Nominal				

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(ChedokeArmandHandActivityInventoryVersion8)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(ABILHAND)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Stroke-specificPatientReportedOutcomeMeasures(LondonHandicapScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Geller, 2022

Bibliographic Reference	Geller, Daniel; Nilsen, Dawn M; Quinn, Lori; Van Lew, Stephen; Bayona, Claribell; Gillen, Glen; Home mirror therapy: a randomized controlled pilot study comparing unimanual and bimanual mirror therapy for improved arm and hand function post-stroke.; Disability and rehabilitation; 2022; vol. 44 (no. 22); 6766-6774

Study details

Secondary publication of another included study- see primary study for details	NR

Other publications associated with this study included in review	NR
Trial name / registration number	NCT02780440
Study type	Randomised controlled trial (RCT)
Study location	USA
Study setting	Outpatient OT department
Study dates	NR
Sources of funding	NR
Inclusion criteria	Aged 19 to 85 with a first-time stroke at least >3 months ago; Fugl-Meyer Assessment score of 10–50 indicating moderate-to-severe arm impairment; following directions; ability to grasp and release a washcloth with the affected hand.
Exclusion criteria	Complex medical problems and pre-existing neurological or psychiatric disease; hearing and/or visual impairments; perceptual deficits, such as apraxia, neglect, and visual agnosia; botulinum toxin injection in the affected limb <3 months prior to study inclusion; aphasia.
Recruitment / selection of participants	Participants were recruited from an outpatient occupational therapy department in the New York metropolitan area
Intervention(s)	Mirror therapy (Unilateral or bilateral mirror therapy) N=17 2 treatment groups combined for the purposes of this review. Both participated in a home based mirror therapy program for which they received education from an occupational therapist for 1 hour before going home. Group 1 (n=10) received unilateral mirror therapy and were instructed to keep their affected hand static within the mirror box. Group 2 (n=7) received bilateral mirror therapy and were instructed to move their affected arm and duplicated the movements as best as possible. Participants were instructed to perform 30 minutes a day, 5 days a week of exercises divided into three 10 minute categories: 1) moving the arm/hand, 2) functional task with objects, 3) object manipulation. This was conducted over 6 weeks.

	Concomitant therapy: All people received two 45-minute standard occupational therapy sessions in the clinic, one weekly 30-minute session with the primary research occupational therapist and the home-based program.
Comparator	Usual care N=8 The same tasks as the mirror therapy group for the same time but without a mirror. Concomitant therapy: All people received two 45-minute standard occupational therapy sessions in the clinic, one weekly 30-minute session with the primary research occupational therapist and the home-based program.
Number of participants	25
Duration of follow-up	6 weeks (end of intervention)
Additional comments	No additional information. Not all people randomised were analysed (appears to be completers only).
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Unsupervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear

Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (Unilateral or bilateral mirror therapy) (N = 17)

2 treatment groups combined for the purposes of this review. Both participated in a home based mirror therapy program for which they received education from an occupational therapist for 1 hour before going home. Group 1 (n=10) received unilateral mirror therapy and were instructed to keep their affected hand static within the mirror box. Group 2 (n=7) received bilateral mirror therapy and were instructed to move their affected arm and duplicated the movements as best as possible. Participants were instructed to perform 30 minutes a day, 5 days a week of exercises divided into three 10 minute categories: 1) moving the arm/hand, 2) functional task with objects, 3) object manipulation. This was conducted over 6 weeks. Concomitant therapy: All people received two 45-minute standard occupational therapy sessions in the clinic, one weekly 30-minute session with the primary research occupational therapist and the home-based program.

Usual care (N = 8)

The same tasks as the mirror therapy group for the same time but without a mirror. Concomitant therapy: All people received two 45-minute standard occupational therapy sessions in the clinic, one weekly 30-minute session with the primary research occupational therapist and the home-based program.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (Unilateral or bilateral mirror therapy) (N = 17)	Usual care (N = 8)
% Female Sample size	n = 8 ; % = 47	n = 2 ; % = 25
Mean age (SD) (years) Mean (SD)	57.5 (14.1)	65.3 (15.4)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	20.4 (28.5)	48.8 (94.5)

Outcomes

Study timepoints

- Baseline
- 6 week (End of the intervention)

Continuous outcomes

Outcome	Mirror therapy (Unilateral or bilateral mirror therapy), Baseline, N = 14	Mirror therapy (Unilateral or bilateral mirror therapy), 6 week, N = 14	Usual care, Baseline, N = 7	Usual care, 6 week, N = 7
Upper limb and hand motor function (Action Research Arm Test) Scale range: 0-57. Change scores. Reported as MD (95% CI) but converted to mean SD as mirror therapy groups had to be combined for the analysis. Unilateral mirror therapy = 3.13 (-3.22 to 9.47). Bilateral mirror therapy = 0.70 (-4.64, 6.03). Usual care = 2.43 (-5.10, 9.96). Mean (SD)	15.3 (13.1)	1.9 (8)	17.8 (14.9)	2.43 (10.2)
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Change scores. Reported as MD (95% CI) but converted to mean SD as mirror therapy groups had to be combined for the analysis. Unilateral mirror therapy = 4.20 (-1.37, 9.76). Bilateral mirror therapy = 0.49 (-5.24, 6.21). Usual care = 3.71 (-1.66, 9.08). Mean (SD)	31.2 (10.5)	2.35 (7.84)	29.6 (9.61)	2.43 (10.17)
Measures of motor impairment (Grip strength) (kg) Change scores. Reported as MD (95% CI) but converted to mean SD as mirror therapy groups had to be combined for the analysis.	13.8 (15.6)	-2.1 (13.9)	18.6 (12.4)	-6.19 (5.4)

Outcome	Mirror therapy (Unilateral or bilateral mirror therapy), Baseline, N = 14	Mirror therapy (Unilateral or bilateral mirror therapy), 6 week, N = 14	Usual care, Baseline, N = 7	Usual care, 6 week, N = 7
Unilateral mirror therapy = -5.19 (-15.1, 4.70). Bilateral mirror therapy = 1.00 (-9.12, 11.1). Usual care = -6.19 (-10.2, -2.16). Mean (SD)				
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) Change scores. Scale range: 0-100. Reported as MD (95% CI) but converted to mean SD as mirror therapy groups had to be combined for the analysis. Unilateral mirror therapy = -0.18 (-17.4, 17.0). Bilateral mirror therapy = 5.95 (-16.8, 28.7). Usual care = -6.13 (-34.2, 21.9). Mean (SD)	43.9 (17.7)	2.89 (27.4)	42.5 (13.6)	-6.13 (37.9)

Upper limb and hand motor function (Action Research Arm Test) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Measures of motor impairment (Grip strength) - Polarity - Higher values are better

Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Polarity - Higher values are better

Dichotomous outcome

Outcome	Mirror therapy (Unilateral or bilateral mirror therapy), Baseline, N = 17	Mirror therapy (Unilateral or bilateral mirror therapy), 6 week, N = 17	Usual care, Baseline, N = 7	Usual care, 6 week, N = 7
Dropout rate	n = NA ; % = NA	n = 3 ; % = 18	n = NA ; % = NA	n = 0 ; % = 0

Outcome	Mirror therapy (Unilateral or bilateral mirror therapy), Baseline, N = 17	Mirror therapy (Unilateral or bilateral mirror therapy), 6 week, N = 17	Usual care, Baseline, N = 7	Usual care, 6 week, N = 7
No of events				

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Upperlimbandhandmotorfunction(ActionResearchArmTest)-MeanSD-Mirror therapy (Unilateral or bilateral mirror therapy)-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-MeanSD-Mirror therapy (Unilateral or bilateral mirror therapy)-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Measuresofmotorimpairment(Gripstrength)-MeanSD-Mirror therapy (Unilateral or bilateral mirror therapy)-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-MeanSD-Mirror therapy (Unilateral or bilateral mirror therapy)-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Mirror therapy (Unilateral or bilateral mirror therapy)-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Geller, 2016

Bibliographic Reference	Geller, Daniel; Nilsen, Dawn; Van Lew, Stephen; Gillen, Glen; Bernardo, Matthew; Home Mirror Therapy: A Randomized Controlled Pilot Study Comparing Unimanual and Bimanual Mirror Therapy for Improved Upper Limb Function Post-Stroke; Archives of Physical Medicine and Rehabilitation; 2016; vol. 97 (no. 10); e4

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	USA
Study setting	outpatient (home)
Study dates	NR
Sources of funding	NR
Inclusion criteria	Subjects with first time unilateral stroke occurring at least 3 months prior with UE Fugl Meyer (FM) scores between 10 and 50
Exclusion criteria	NR

Recruitment / selection of participants	NR
Intervention(s)	6 weeks, 2 times a week OT in the clinic for all groups bimanual mirror therapy as home programme - 6 weeks, 5 days a week, 30-minute home programme Unimanual mirror therapy as home programme -6 weeks, 5 days a week, 30-minute home programme
Comparator	6 weeks, 2 times a week OT in the clinic for all groups 6 weeks, 5 days a week, 30-minute home programme of traditional OT
Number of participants	6
Duration of follow-up	NR
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Not stated/unclear

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	

Study arms

bimanual mirror therapy (N = 2)

unimanual mirror therapy (N = 2)

traditional OT (N = 2)

Characteristics

Study-level characteristics

Characteristic	Study (N =)
% Female Nominal	3
Mean age (SD) Range	34 to 73
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Outcomes

narrative data only

Outcome	bimanual mirror therapy, , N = 2	unimanual mirror therapy, , N = 2	traditional OT, , N = 2
all narrative data All groups improved on the FM and ARAT; however, UMT had the greatest change score, followed by BMT then TOT in the FM (9.5,9,8) and ARAT (9,7,2). For SIS ADL, both UMT (23) and BMT (21) improved more than TOT (10), while for SIS strength, the UMT improved the most (10), as compared to TOT (7.5) and BMT (5). However, for SIS participation, the TOT improved the most (11), followed by BMT (6), then UMT (4). Mean (SD)	NR (*empty data*)	*empty data*	*empty data*

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

narrativedataonly-allnarrativedata-MeanSD-bimanual mirror therapy-unimanual mirror therapy-traditional OT

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable

Guo, 2019

Bibliographic Reference	Guo, J.; Qian, S.; Wang, Y.; Xu, A.; Clinical study of combined mirror and extracorporeal shock wave therapy on upper limb spasticity in poststroke patients; International Journal of Rehabilitation Research; 2019; vol. 42 (no. 1); 31-35

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	China
Study setting	hospital inpatients
Study dates	January 2015 - December 2017
Sources of funding	NR
Inclusion criteria	Participants with disease duration more than 6 months, with modified Ashworth scale (MAS) score more than 1 and less than 4 for the upper limb flexor tension, with no cognitive problems, and who can understand and follow simple verbal instructions were recruited.
Exclusion criteria	NR
Recruitment / selection of participants	NR
Intervention(s)	The conventional program consisted of exercise therapy, occupational therapy, and neurodevelopmental facilitation techniques.

	Mirror therapy + conventional rehab = Patients in group A sat on a stool in front of a table with a 30-cm mirror. The affected hand was placed behind the mirror so that it could not be seen, and the unaffected hand was placed in the reflecting side of the mirror. Patients were asked to move their wrist while simultaneously observing the reflection of the unaffected hand. MT was for 20 min per day, five times a week, for 4 weeks. In addition patients received conventional rehabilitation therapy for 30 min per day, five times a week, for 4 weeks. Mirror therapy + EWST - Patients performed MT and received ESWT in parallel on the wrist extensor of the affected side. MT + EWST MT was for 20 min per day, five times a week, for 4 weeks. In addition patients received conventional rehabilitation therapy for 30 min per day, five times a week, for 4 weeks.
Comparator	EWST + conventional rehab - patients received 2000 shots with a pressure of 2.0–3.0 bar and frequency of 8 Hz were used diffusely for the intrinsic muscles and flexor digitorum tendon of the hand by an ultrasound pointer guide (Terason, t3000; Teratech, Burlington, Massachusetts, USA). The procedure was within tolerable pain limits. EWST was performed for 20 min per day, five times a week, for 4 weeks. In addition patients received conventional rehabilitation therapy for 30 min per day, five times a week, for 4 weeks. The conventional program consisted of exercise therapy, occupational therapy, and neurodevelopmental facilitation techniques.

	Conventional rehab alone - The conventional program consisted of exercise therapy, occupational therapy, and neurodevelopmental facilitation techniques for 30 min per day, five times a week, for 4 weeks.
Number of participants	120
Duration of follow-up	1, 3, 6 and 12 months
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy + ESWT (N = 30)

ESWT = extracorporeal shock wave therapy

Mirror therapy + conventional rehab (N = 30)

ESWT + conventional rehab (N = 30)

ESWT = extracorporeal shock wave therapy

Conventional rehab (N = 30)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 120)**
% Female Nominal	53
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	mirror therapy + ESWT (N = 30)	Mirror therapy + conventional rehab (N = 30)	ESWT + conventional rehab (N = 30)	Conventional rehab (N = 30)
Mean age (SD) Mean (SD)	68.72 (10.56)	67.15 (11.23)	66.79 (11.02)	69.72 (11.13)
Type of stroke Ischaemic Nominal	15	14	12	13
Time period since stroke Mean (SD)	3.13 (1.02)	3.41 (0.79)	3.23 (0.82)	3.49 (0.93)

Outcomes

Study timepoints

- Baseline
- 3 month
- 12 month

outcomes at 3 and 12 months

Outcome	mirror therapy + ESWT, Baseline, N = 30	mirror therapy + ESWT, 3 month, N = 30	mirror therapy + ESWT, 12 month, N = 30	Mirror therapy + conventional rehab, Baseline, N = 30	Mirror therapy + conventional rehab, 3 month, N = 30	Mirror therapy + conventional rehab, 12 month, N = 30	ESWT + conventional rehab, Baseline, N = 30	ESWT + conventional rehab, 3 month, N = 30	ESWT + conventional rehab, 12 month, N = 30	Conventional rehab, Baseline, N = 30	Conventional rehab, 3 month, N = 30	Conventional rehab, 12 month, N = 30
Fugl-Meyer Assessment Upper Extremity 0-66 Mean (SD)	12.63 (2.08)	22.13 (3.15)	29.73 (2.35)	12.86 (2.89)	18.62 (2.91)	22.23 (2.12)	13.06 (3.01)	19.08 (3.96)	23.98 (0.91)	12.36 (2.38)	17.23 (3.91)	19.46 (2.87)
Adverse events Nominal	0	0	0	0	0	0	0	0	0	0	0	0

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

outcomesat3and12months-Fugl-MeyerAssessmentUpperExtremity-MeanSD-mirror therapy + ESWT-Mirror therapy + conventional rehab-ESWT + conventional rehab-Conventional rehab-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study combines MT with ESWT)*

outcomesat3and12months-Fugl-MeyerAssessmentUpperExtremity-MeanSD-mirror therapy + ESWT-Mirror therapy + conventional rehab-ESWT + conventional rehab-Conventional rehab-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study combines MT with ESWT)*

outcomesat3and12months-Adverseevents-Nominal-mirror therapy + ESWT-Mirror therapy + conventional rehab-ESWT + conventional rehab-Conventional rehab-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(study combines MT with ESWT)*

outcomesat3and12months-Adverseevents-Nominal-mirror therapy + ESWT-Mirror therapy + conventional rehab-ESWT + conventional rehab-Conventional rehab-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(study combines MT with ESWT)*

Gurbuz, 2016

Bibliographic Reference	Gurbuz, Nigar; Afsar, Sevgi Ikbali; Ayaş, Sehri; Cosar, Sacide Nur Saracgil; Effect of mirror therapy on upper extremity motor function in stroke patients: a randomized controlled trial; Journal of physical therapy science; 2016; vol. 28 (no. 9); 2501-2506

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR

Study location	Turkey
Study setting	inpatient rehabilitation centre
Study dates	July 2013 to July 2014
Sources of funding	NR
Inclusion criteria	unilateral hemiplegia due to first-ever stroke (verified by CT or MRI); < 6 months; BRS for the upper extremity between I and IV; MMSE 24 and above; lack of excessive spasticity in the joints of the affected upper extremity (stage 2 and below according to the mAS)
Exclusion criteria	joint movement limitations in the healthy upper extremity; a visual field defect or neglect syndrome; and those who had previously undergone a rehabilitation programme
Recruitment / selection of participants	NR
Intervention(s)	4 weeks, 5 times a week, 60 to 120 minutes upper extremity rehabilitation programme + additional mirror therapy: activities of the affected limb; flexion and extension of the wrist and finger - 4 weeks, 5 times a week, 20 minutes MT
Comparator	4 weeks, 5 times a week, 60 to 120 minutes upper extremity rehabilitation programme + Additional sham therapy: same therapy protocol with a covered mirror (activities of the affected limb; flexion and extension of the wrist and finger). 4 weeks, 5 times a week, 20 minutes sham therapy
Number of participants	31
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

upper extremity rehabilitation programme + mirror therapy (N = 16)

upper extremity rehabilitation programme + sham mirror therapy (N = 15)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 31)**
% Female Nominal	14
Mean age (SD) Mean (SD)	60.9 (NR)
Ethnicity	NR

Characteristic	Study (N = 31)
Nominal	
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischemic Nominal	25
Time period since stroke (day) Mean (SD)	43.3 (NR)
side of paresis (left) Nominal	14

Outcomes

Study timepoints

- 4 week

4 week outcomes

Outcome	upper extremity rehabilitation programme + mirror therapy, 4 week, N = 16	upper extremity rehabilitation programme + sham mirror therapy, 4 week, N = 15
functional impairment (FMA upper extremity score) 0-66 Mean (SD)	27.1 (14.5)	17.3 (11.7)
FIM self-care subscale (Turkish version) Mean (SD)	19.8 (8.1)	16.9 (6.4)

functional impairment (FMA upper extremity score) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-FIMself-caresubscale(Turkishversion)-MeanSD-upper extremity rehabilitation programme + mirror therapy-upper extremity rehabilitation programme + sham mirror therapy

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-functionalimpairment(FMAupperextremityscore)-MeanSD-upper extremity rehabilitation programme + mirror therapy-upper extremity rehabilitation programme + sham mirror therapy

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-functionalimpairment(FMAupperextremityscore)-MeanSD-upper extremity rehabilitation programme + mirror therapy-upper extremity rehabilitation programme + sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-FIMself-caresubscale(Turkishversion)-MeanSD-upper extremity rehabilitation programme + mirror therapy-upper extremity rehabilitation programme + sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Hassan M. Abo Salem, 2015

Bibliographic Reference	Hassan M. Abo Salem XH; The effects of mirror therapy on clinical improvement in hemiplegic lower extremity rehabilitation in subjects with chronic stroke; World Academy of Science, Engineering and Technology International Journal of Biomedical and Biological Engineering; 2015; vol. 9 (no. 2); 1-4

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	China
Study setting	NR
Study dates	NR
Sources of funding	NR
Inclusion criteria	The inclusion criteria were:(1) First episode of unilateral stroke with hemiparesis, (2) disease duration with more than 12 months, (3) ability to walk with supervision and/or with aids >10 meters, (4) ability to understand and follow simple verbal instructions.

Exclusion criteria	The exclusion criteria were: (1) any pre-existing neurological disorder other than the stroke, (2) any additional psychological or medical condition that would affect patient's ability to comply with study protocol, (3) patients with impaired vision or aphasia, (4) fixed ankle or foot contracture.
Recruitment / selection of participants	NR
Intervention(s)	Both the experimental group and the control group received in a conventional stroke rehabilitation program 5 days a week, 2 to 5 hours a day, for 4 weeks. The conventional program was patient-specific and consisted of occupational therapy, physiotherapy, electrotherapy, neurodevelopmental facilitation techniques and gait training. The experimental group received an additional 30 min of MT training. The patients were instructed to remain in sitting position with a mirror (60 cm × 90 cm) was positioned between the two legs perpendicular to the subject's midline. During the MT training, the reflecting side of the mirror was adjusted to the non-affected leg and patients were instructed to look at the reflection of the unaffected leg in the mirror as if it were the affected leg and perform bilateral symmetrical movements as much as possible. The practices consist of (1) hip-knee-ankle flexion, (2) ankle dorsiflexion, (3) ankle eversion.
Comparator	Both the experimental group and the control group received in a conventional stroke rehabilitation program 5 days a week, 2 to 5 hours a day, for 4 weeks. The conventional program was patient-specific and consisted of occupational therapy, physiotherapy, electrotherapy, neurodevelopmental facilitation techniques and gait training. The control group performed the same exercises for the same duration but used the non-reflecting side of the mirror. The same therapist delivered the mirror or sham therapy to the patients.
Number of participants	30
Duration of follow-up	4 weeks
Additional comments	

Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

Mirror therapy (N = 15)

conventional rehab (N = 15)

Characteristics

Study-level characteristics

Characteristic	Study (N = 30)
% Female Nominal	15

Arm-level characteristics

Characteristic	Mirror therapy (N = 15)	conventional rehab (N = 15)
Mean age (SD) Mean (SD)	60 (8.97)	59.1 (9.1)
Type of stroke ischaemic Nominal	10	11
Time period since stroke Mean (SD)	14.9 (1.83)	15.4 (1.28)
side of paresis (left) Nominal	6	7

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	Mirror therapy , Baseline, N = 15	Mirror therapy , 4 week, N = 15	conventional rehab, Baseline, N = 15	conventional rehab, 4 week, N = 15
Measures of motor impairment (– Brunnstrom Stages of the Lower Extremity) 1-7 Mean (SD)	3.1 (1.21)	3.79 (1.23)	2.8 (1.15)	3.16 (1.21)

Measures of motor impairment (– Brunnstrom Stages of the Lower Extremity) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Measuresofmotorimpairment(– BrunnstromStagesoftheLowerExtremity)-MeanSD-Mirror therapy -conventional rehab-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Hatwar, 2019

Bibliographic Reference	Hatwar, N.; Suchetha, P.; Kumar, D.; Combined effectiveness of mirror therapy and motor imagery on gait in stroke patients; International journal of current research and review; 2019; vol. 11; 5-10

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India
Study setting	rehabilitation unit
Study dates	NR
Sources of funding	nil
Inclusion criteria	The participants were included based on the following criteria: a) Patients who are less than 6 months post-stroke b) Age-45-65 years c) Ability to walk with minimal assistance (functional ambulation category less than or equal to 3.) d) No remarkable cognitive deficit (an outcome more than 25 on mini-mental status examination).
Exclusion criteria	The exclusion criteria were: a) Any musculoskeletal disorder impeding lower limb function), Any neglect of space on the affected side, or any other neurological disease or auditory or visual c) Any psychiatric disorders.

Recruitment / selection of participants	Participants with stroke were recruited from Justice K S Hegde charitable hospital, Mangalore. These participants were screened based on inclusion criteria and consent was taken from selected participants.
Intervention(s)	In mirror therapy, the patient was made to sit and a mirror was mounted in between the legs of the patient in such a way that the paretic leg was on the non-reflective side of the mirror while the non-paretic limb was facing the reflective side of the mirror. The patient was made to perform the following exercises using the non-paretic leg; Hip flexion, knee flexion, ankle flexion, Knee extension with ankle dorsiflexion, Full knee flexion Components of gait which were missing were focussed more. patients were given 15 minutes of mirror therapy,15 minutes of motor imagery and 30 minutes of conventional rehabilitation. The interventions were given for 2 weeks (5 days a week). Conventional treatment was given according to patient's requirements which included stretching, active and passive range of motion exercises, weight bearing, balance and coordination exercises.
Comparator	In motor imagery therapy, the patient was made to sit on a chair with eyes closed in a quiet room. He was then made to listen to motor imagery scripts through headphones. The patients were made to imagine all gait specific lower limb movements. The scripts were recorded in local languages. patients were given given 15 minutes of motor imagery and 45 minutes of conventional treatment. The interventions were given for 2 weeks (5 days a week). Conventional treatment was given according to patient's requirements which included stretching, active and passive range of motion exercises, weight bearing, balance and coordination exercise.
Number of participants	38
Duration of follow-up	2 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

lower limb mirror therapy, motor imagery, and conventional rehabilitation (N = 19)

Motor imagery, and conventional rehabilitation (N = 19)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 38)**
% Female Nominal	11
Ethnicity Nominal	NR
Comorbidities Nominal	NR

Characteristic	Study (N = 38)
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Arm-level characteristics

Characteristic	lower limb mirror therapy, motor imagery, and conventional rehabilitation (N = 19)	Motor imagery, and conventional rehabilitation (N = 19)
Mean age (SD) Mean (SD)	52.95 (9.16)	57.42 (8.03)

Outcomes

Study timepoints

- Baseline
- 2 week

2 week outcomes

Outcome	lower limb mirror therapy, motor imagery, and conventional rehabilitation, Baseline, N = 19	lower limb mirror therapy, motor imagery, and conventional rehabilitation, 2 week, N = 18	Motor imagery, and conventional rehabilitation, Baseline, N = 19	Motor imagery, and conventional rehabilitation, 2 week, N = 16
Measures of motor impairment (Fugl Meyer assessment of lower extremity) 0-34 Mean (SD)	75.74 (4.28)	83.06 (3.95)	74.47 (3.08)	81 (4.2)
Drop outs Nominal	1	*empty data*	3	*empty data*

Measures of motor impairment (Fugl Meyer assessment of lower extremity) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

2weekoutcomes-Dropouts-Nominal-lower limb mirror therapy, motor imagery, and conventional rehabilitation-Motor imagery, and conventional rehabilitation-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines MT with motor imagery)*

2weekoutcomes-Measuresofmotorimpairment(FuglMeyerassessmentoflowerextremity)-MeanSD-lower limb mirror therapy, motor imagery, and conventional rehabilitation-Motor imagery, and conventional rehabilitation-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines MT with motor imagery)*

HIRAGAMI, 2013

Bibliographic Reference	HIRAGAMI, Shogo; INOUE, Yu; SATO, Yukari; KAGAWA, Kojiro; HARADA, Kazuhiro; The effect of mirror therapy on finger motor dysfunction after stroke; Journal of the Japanese Physical Therapy Association; 2013; vol. 16 (no. 1); 56

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Japan.
Study setting	Inpatient hospital.
Study dates	October 2010 to March 2011.
Sources of funding	Not stated.
Inclusion criteria	1st episode of stroke with hemiparesis or second episode of stroke with no upper limb motor dysfunction after 1st stroke, > 1 month since stroke, Brunnstrom recovery stage finger 1 - 5, no severe cognitive disorders (MMSE score i 24, and item score of consciousness, gaze, visual fields, language, attention of National Institutes of Health Stroke scale = 0)
Exclusion criteria	Hypertonia of upper limb, limitation in range of motion of upper limb, other diseases interfering with ability to move upper limbs
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=7 Mirror therapy. Non-paretic-side movements (e.g. supination and eversion of the forearm, flexion and extension of the wrist and finger, grasp a block) while participants looked into the mirror. During the session participants were asked to try to do the same movements with the paretic hand. 4 weeks, 6 - 7 days a week, daily 2 hours with an additional 30 minutes MT. Concomitant therapy: Conventional stroke rehabilitation programme (physiotherapy, occupational therapy).
Comparator	Usual care N=7 No additional therapy. Concomitant therapy: Conventional stroke rehabilitation programme (physiotherapy, occupational therapy). 4 weeks, 6 - 7 days a week, daily 2 hours.

Number of participants	14
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	Limb therapy is used for: Upper limb (specifically the forearm, wrist and finger).

Study arms

Mirror therapy (N = 7)

Mirror therapy. Non-paretic-side movements (e.g. supination and eversion of the forearm, flexion and extension of the wrist and finger, grasp a block) while participants looked into the mirror. During the session participants were asked to try to do the same movements

with the paretic hand. 4 weeks, 6 - 7 days a week, daily 2 hours with an additional 30 minutes MT. Concomitant therapy: Conventional stroke rehabilitation programme (physiotherapy, occupational therapy).

Usual care (N = 7)

No additional therapy. Concomitant therapy: Conventional stroke rehabilitation programme (physiotherapy, occupational therapy). 4 weeks, 6 - 7 days a week, daily 2 hours.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 14)**
% Female Nominal	6
Mean age (SD) (years) Mean (SD)	67.5 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Characteristic	Study (N = 14)
Ischaemic Nominal	9
Haemorrhagic Nominal	5
Time period since stroke (days) Mean (SD)	47 (NR)
Left Nominal	6
Right Nominal	8

Outcomes

Study timepoints

- Baseline
- 4 week

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 7	Mirror therapy, 4 week, N = 7	Usual care, Baseline, N = 7	Usual care, 4 week, N = 7
Upper limb and hand motor function (outcome unclear, Wolf Motor Function Test?) The Cochrane review reports that Brunstrom Recovery Stages, Fugl-Meyer Upper Extremity Motor and Wolf Motor Function Test are reported. Unclear which this outcome belongs to. Mean (SD)	NR (NR)	2.9 (1)	NR (NR)	2.6 (1.9)
Activities of Daily Living (Functional Independence Scale - Self Care items) Scale range: 18 to 126. Final value. Mean (SD)	NR (NR)	37.7 (3.9)	NR (NR)	33.1 (7.5)

Upper limb and hand motor function (outcome unclear, Wolf Motor Function Test?) - Polarity - Higher values are better

Activities of Daily Living (Functional Independence Scale - Self Care items) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 7	Mirror therapy, 4 week, N = 7	Usual care, Baseline, N =	Usual care, 4 week, N =
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbandhandmotorfunction(outcomeunclear,WolfMotorFunctionTest?)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-ActivitiesofDailyLiving(FunctionalIndependenceScale-SelfCareitems)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Hsieh, 2020

Bibliographic Reference	Hsieh, Y. W.; Lin, Y. H.; Zhu, J. D.; Wu, C. Y.; Lin, Y. P.; Chen, C. C.; Treatment Effects of Upper Limb Action Observation Therapy and Mirror Therapy on Rehabilitation Outcomes after Subacute Stroke: A Pilot Study; Behavioural Neurology; 2020; vol. 2020; 6250524

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Taiwan
Study setting	rehabilitation centre
Study dates	NR
Sources of funding	This study was supported by the Ministry of Science and Technology (MOST 105-2314-B-182-018 and MOST 106- 2314-B-182-015-MY3) and partly supported by the Healthy Aging Research Center, Chang Gung University, from the Featured Areas Research Center Program within the Framework of the Higher Education Sprout Project by the Ministry of Education (EMRPD1I0451) in Taiwan and the Chang Gung Memorial Hospital (BMRPD25) in Taiwan.
Inclusion criteria	The inclusion criteria of the patients were the following: (1) diagnosis of cerebral ischemic or haemorrhagic stroke, (2) 1 to 6 months since unilateral stroke onset, (3) age between 20 and 80 years, (4) baseline score of the FMA between 20 and 60,

	(5) ability to follow the study instructions (assessed by the Taiwan version of the Montreal Cognitive Assessment), and (6) ability to participate in study therapy and assessment sessions.
Exclusion criteria	The patients were excluded if they had the following: (1) global or receptive aphasia, (2) severe neglect, or (3) major medical problems or comorbidities that influenced the usage of the upper limbs or caused severe pain.
Recruitment / selection of participants	NR
Intervention(s)	During the mirror therapy, the patients were seated in front of a mirror box placed at their midsagittal plane. The affected arm of the participants was placed inside the mirror box, and the unaffected arm was in front of the mirror. The patient was instructed to watch the mirror reflection of the movement performed by his/her unaffected hand carefully and to imagine that the movement was performed by the affected hand. The participant was also encouraged to move the affected arm and hand as much as they could. In the mirror therapy group, treatment activities also contained AROM exercises (10–15 minutes), reaching movement or object manipulation (15–20 minutes), and functional task practice (30 minutes) During treatment, the therapists provided verbal instructions, cues, feedback, and help to patients, when needed. The study intervention was additional therapy, and all routine conventional rehabilitation programs (e.g., occupational and/or physical therapy) have been provided as usual Each participant received intervention for 15 training sessions (60 minutes/day, 5 days/week for 3 weeks). Treatment was provided by licensed occupational therapists who were well trained in the treatment protocols.
Comparator	Customary Bilateral Arm Training. The patients in the active control intervention group received dose-matched bilateral arm training provided by a certified occupational therapist, but no video input or mirror box was provided for this group. In the active control intervention, the same 3 categories of movements and tasks as provided in the action observation therapy and mirror therapy groups were used. Treatment programs also included AROM exercises (10–15 minutes), reaching movement or object manipulation (15–20 minutes), and functional task practice (30 minutes). AROM exercises included bilateral shoulder, elbow, forearm, wrist, and finger movements. Object manipulation tasks were in-hand manipulation, grasp and release, and transporting and turning objects with both hands. Examples of functional tasks were reading a magazine, folding clothes, wiping a table, and opening a small drawer with bilateral arm and hand movements. During

	training, the patients were required to move both of their arms and hands simultaneously as possible. Based on the patient's level of motor ability and progress, the levels of movement and task difficulty could be adjusted accordingly. During treatment, the therapists provided verbal instructions, cues, feedback, and help to patients, when needed. The study intervention was additional therapy, and all routine conventional rehabilitation programs (e.g., occupational and/or physical therapy) have been provided as usual Each participant received intervention for 15 training sessions (60 minutes/day, 5 days/week for 3 weeks). Treatment was provided by licensed occupational therapists who were well trained in the treatment protocols.
Number of participants	14
Duration of follow-up	post intervention and 3 months post intervention
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy group (N = 7)

active control group (N = 7)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 14)**
% Female Nominal	2
Comorbidities Nominal	NR
Type of stroke ischaemic Nominal	5

Arm-level characteristics

Characteristic	mirror therapy group (N = 7)	active control group (N = 7)
Mean age (SD) Mean (SD)	46.41 (13.45)	54.3 (13.61)
Time period since stroke (Months) Mean (SD)	4.86 (1.95)	2.57 (1.62)
side of paresis left Nominal	3	4

Outcomes

Study timepoints

- Baseline
- 3 month (3 months post 3 week intervention)

3 month outcomes

Outcome	mirror therapy group, Baseline, N = 7	mirror therapy group, 3 month, N = 7	active control group, Baseline, N = 7	active control group, 3 month, N = 7
Fugl Meyer Asessment total 0-66 Mean (SD)	43.29 (13.72)	48 (15.2)	39.57 (6.55)	49.43 (7.93)

Outcome	mirror therapy group, Baseline, N = 7	mirror therapy group, 3 month, N = 7	active control group, Baseline, N = 7	active control group, 3 month, N = 7
Upper limb and hand motor function (Box and block test) 0-150 Mean (SD)	17.28 (17.5)	22.29 (18.18)	9 (7.66)	17.71 (14.43)
ADLs (Functional Independence Measure) 0-126 Mean (SD)	110.14 (5.34)	116 (4.69)	113.57 (5.47)	119.71 (4.5)
Stroke-specific Patient-Reported Outcome Measures (stroke impact scale- total) 0-100 Mean (SD)	62.96 (9.93)	76.79 (6.25)	68.85 (10.28)	78.12 (8.97)
Adverse events Nominal	0	0	0	0

Fugl Meyer Asessment total - Polarity - Higher values are better

Upper limb and hand motor function (Box and block test) - Polarity - Higher values are better

ADLs (Functional Independence Measure) - Polarity - Higher values are better

Stroke-specific Patient-Reported Outcome Measures (stroke impact scale- total) - Polarity - Higher values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

3monthoutcomes-FuglMeyerAsessmenttotal-MeanSD-mirror therapy group-active control group-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(study was underpowered as only 7 pts in each group - however was a pilot study)*
Overall bias and Directness	Overall Directness	Directly applicable

3monthoutcomes-Upperlimbandhandmotorfunction(Boxandblocktest)-MeanSD-mirror therapy group-active control group-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(study was underpowered as only 7 pts in each group - however was a pilot study)*
Overall bias and Directness	Overall Directness	Directly applicable

3monthoutcomes-ADLs(FunctionalIndependenceMeasure)-MeanSD-mirror therapy group-active control group-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(study was underpowered as only 7 pts in each group - however was a pilot study)*
Overall bias and Directness	Overall Directness	Directly applicable

3monthoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(strokeimpactscale-total)-MeanSD-mirror therapy group-active control group-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(study was underpowered as only 7 pts in each group - however was a pilot study. no blinding of pts)*
Overall bias and Directness	Overall Directness	Directly applicable

3monthoutcomes-Adverseevents-Nominal-mirror therapy group-active control group-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Hsu, 2022

Bibliographic Reference	Hsu, HY; Kuo, LC; Lin, YC; Su, FC; Yang, TH; Lin, CW; Effects of a Virtual Reality-Based Mirror Therapy Program on Improving Sensorimotor Function of Hands in Chronic Stroke Patients: a Randomized Controlled Trial; Neurorehabilitation and neural repair; 2022; vol. 36 (no. 6); 335-345

Study details

Secondary publication of another included	NR

study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NCT03329417.
Study type	Randomised controlled trial (RCT)
Study location	Taiwan
Study setting	Physical medicine and rehabilitation at a medical center in South Taiwan
Study dates	October 2017 and April 2020.
Sources of funding	The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The work received support from the ministry of science and technology (MOST), Taiwan. [Grant number: 106-2314-B-006-049-MY2].
Inclusion criteria	(1) chronic stroke patient with unilateral cerebral infarction or hemorrhage, and whose disease duration was more than 6 months following stroke, (2) an FM-UE score ranging from 23 to 60, corresponding to poor to notable arm-hand capacity, and (3) a mini-mental state examination (MMSE) score not lower than 24.
Exclusion criteria	CT showing multiple cerebral infarctions or hemorrhage; not being able to have a VR experience due to visual problems; severe hemineglect; and global aphasia leading to difficulty with following written or spoken multi-step instructions.
Recruitment / selection of participants	Patients were recruited from the department of physical medicine and rehabilitation at a medical center in South Taiwan between October 2017 and April 2020.
Intervention(s)	In addition to 20 minutes of therapist-facilitated task-specific training as a usual care session, the patients each received 30 minutes of VR-MT or 30 minutes of mirror therapy. The sequences of the hand exercises of MT and VR-MT consisted of the movements of forearm supination/pronation, wrist extension/ flexion, finger extension/flexion, thumb opposition with the little finger, thumb extension/flexion, and tendon-gliding exercises, which involve a series of hand movements (straight hand, hook fist, straight fist, and full fist). Each movement was repeated 50 times. The participant sat in a comfortable chair in front of a desk with either a traditional mirror box or the VR-MT system during MT/VR-MT treatment. The participants were

	instructed to look at the virtual affected hand through VR goggles in the VR-MT condition and to look at the motion of the mirror illusion in the MT condition. Concomitant therapy: All of the participants received occupational therapy in addition to physical therapy and speech therapy as indicated.
Comparator	Patients in the COT group received sensorimotor stimulation and skill training related to daily living tasks, including those involving remediating and compensatory strategies. Concomitant therapy: All of the participants received occupational therapy in addition to physical therapy and speech therapy as indicated.
Number of participants	52
Duration of follow-up	9 weeks
Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	NR

Study arms

Mirror therapy + Virtual reality mirror therapy (N = 35)

Two groups: In addition to 20-minute sessions of task-specific training, patients received programs of 30 minutes of 1) VR-MT or 2) 30 minutes of MT, both twice a week for 9 weeks

Usual care (N = 17)

In addition to 20-minute sessions of task-specific training, patients received 30 minutes of conventional occupational therapy twice a week for 9 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy + Virtual reality mirror therapy (N = 35)	Usual care (N = 17)
% Female Sample size	n = 20 ; % = 57.1	n = 12 ; % = 70.6

Characteristic	Mirror therapy + Virtual reality mirror therapy (N = 35)	Usual care (N = 17)
Mean age (SD) (years) Mean (SD)	54.7 (11.8)	56.9 (13)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke Months Mean (SD)	35.12 (25.5)	38.1 (26.6)

Outcomes

Study timepoints

- Baseline
- 9 week

Continuous outcomes

Outcome	Mirror therapy + Virtual reality mirror therapy, Baseline, N = 35	Mirror therapy + Virtual reality mirror therapy, 9 week, N = 35	Usual care, Baseline, N = 17	Usual care, 9 week, N = 17
Upper limb and hand motor function (Box and block test) (number of blocks transferred in 60 seconds) Final values Mean (SD)	14.7 (16.6)	16.4 (18)	13.6 (18.5)	14.9 (20.9)
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Final values. Mean (SD)	37.3 (15.6)	40.4 (15.8)	34.5 (17.4)	35.1 (18.6)

Upper limb and hand motor function (Box and block test) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mirror therapy + Virtual reality mirror therapy, Baseline, N = 35	Mirror therapy + Virtual reality mirror therapy, 9 week, N = 35	Usual care, Baseline, N = 17	Usual care, 9 week, N = 17
Dropout rate No of events	n = 0 ; % = 0	n = 1 ; % = 2.8	n = 0 ; % = 0	n = 1 ; % = 5.8
Adverse events No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Dropout rate - Polarity - Lower values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity(finalvalues)-MeanSD-Mirror therapy + Virtual reality mirror therapy-Usual care-t9

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Upperlimbandhandmotorfunction(Boxandblocktest)finalvalues-MeanSD-Mirror therapy + Virtual reality mirror therapy-Usual care-t9

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Dropoutrate-NoOfEvents-Mirror therapy + Virtual reality mirror therapy-Usual care-t9

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Adverseevents-NoOfEvents-Mirror therapy + Virtual reality mirror therapy-Usual care-t9

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Hung, 2022

Bibliographic Reference	Hung, JW; Yen, CL; Chang, KC; Chiang, WC; Chuang, IC; Pong, YP; Wu, WC; Wu, CY; A Pilot Randomized Controlled Trial of Botulinum Toxin Treatment Combined with Robot-Assisted Therapy, Mirror Therapy, or Active Control Treatment in Patients with Spasticity Following Stroke; Toxins; 2022; vol. 14 (no. 6)

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Taiwan
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	This work was supported by the Ministry of Science and Technology in Taiwan under 105-2314-B-182A-085, 106-2314-B-182A-121 and 109-2314-B-192-027-MY3; Chang Gung Memorial Hospital under BMRP553, BMRPG8E0931, MRPD1I-0031 and CMRPD1M0041; National Health Research Institutes under NHRI-EX111-11105PI.
Inclusion criteria	Unilateral stroke for at least 6 months duration; Modified Ashworth Scale >1 over the elbow flexor, forearm pronator, wrist flexor and/or finger flexor muscles; upper extremity Fugl-Meyer Assessment score of 17 to 56; Mini-Mental State Exam at least 21.
Exclusion criteria	Pregnancy; bilateral hemispheric or cerebellar lesions; visual field deficits or hemineglect; any contraindications for botulinum toxin; prior botulinum toxin treatment within 4 months of enrollment; joint contracture over the upper extremities; other orthopaedic or neurological diseases that would prevent adherence to the rehabilitation protocol.
Recruitment / selection of participants	People were recruited from the rehabilitation department of a medical center.
Intervention(s)	Mirror therapy N=12 75 minutes of training, 3 times weekly for 8 consecutive weeks. Mirror therapy for 45 minutes of training per session. A mirror box was placed beside the unaffected hand to block the view of the affected hand. People were instructed to focus on the unaffected hand as if it were the affected hand and to perform exercises bilaterally and symmetrically as much as possible. The activities included: transitive movements (such as fine motor tasks of squeezing sponges, placing pegs in holes, flipping a card); gross motor tasks (reaching out to touch a switch or keyboard); intransitive movements (including the distal movement of the wrist, repetitive extension-flexion, or finger opponent, and the proximal part movement of forearm pronation/supination). Following this 45 minute period of training, people received an additional 30 minutes of practice in functional activities to facilitate transferring the acquired movements to daily activities. The selected functional tasks involved forearm pronation-supination or wrist flexion-extension movements, such as twisting a towel or bouncing a ball.

	Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual. Robot arm training N=13 Note: This group is extracted in this report, but will not be used for this review. 75 minutes of training, 3 times weekly for 8 consecutive weeks. Robot arm training using the Bi-Manu-Track robotic arm training system allowing for three training modes: passive-passive, active-passive and active-active. For each movement, the participants practiced 200 repetitions in mode 1, 750 repetitions in mode 2 and 50 to 200 repetitions in mode 3. The feedback on actions or force they exerted during practice was provided. Following this 45 minute period of training, people received an additional 30 minutes of practice in functional activities to facilitate transferring the acquired movements to daily activities. The selected functional tasks involved forearm pronation-supination or wrist flexion-extension movements, such as twisting a towel or bouncing a ball. Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual.
Comparator	Usual care N=12 75 minutes of training, 3 times weekly for 8 consecutive weeks. 45 minutes of conventional task-oriented approach with bilateral symmetric movement training. The movement training involved grasping, manipulating and picking up and placing objects. After this people took part in the same 30 minutes of functional practice as the other groups.

	Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual.
Number of participants	37
Duration of follow-up	8 weeks (end of treatment) and 5 months (end of treatment + 3 months - this is less than the 6 months required for the mirror therapy review, but is the latest possible follow up required for the robot arm therapy review so will be extracted but not used for the mirror therapy review).
Additional comments	All people randomised were included in the analysis (ITT no dropouts).
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Robot arm training (N = 13)

Note: This group is extracted in this report, but will not be used for this review. 75 minutes of training, 3 times weekly for 8 consecutive weeks. Robot arm training using the Bi-Manu-Track robotic arm training system allowing for three training modes: passive-passive, active-passive and active-active. For each movement, the participants practiced 200 repetitions in mode 1, 750 repetitions in mode 2 and 50 to 200 repetitions in mode 3. The feedback on actions or force they exerted during practice was provided. Following this 45 minute period of training, people received an additional 30 minutes of practice in functional activities to facilitate transferring the acquired movements to daily activities. The selected functional tasks involved forearm pronation-supination or wrist flexion-extension movements, such as twisting a towel or bouncing a ball. Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual.

Mirror therapy (N = 12)

75 minutes of training, 3 times weekly for 8 consecutive weeks. Mirror therapy for 45 minutes of training per session. A mirror box was placed beside the unaffected hand to block the view of the affected hand. People were instructed to focus on the unaffected hand as if it were the affected hand and to perform exercises bilaterally and symmetrically as much as possible. The activities included: transitive movements (such as fine motor tasks of squeezing sponges, placing pegs in holes, flipping a card); gross motor tasks (reaching out to touch a switch or keyboard); intransitive movements (including the distal movement of the wrist, repetitive extension-flexion, or finger opponent, and the proximal part movement of forearm pronation/supination). Following this 45 minute period of training, people received an additional 30 minutes of practice in functional activities to facilitate transferring the acquired movements to daily activities. The selected functional tasks involved forearm pronation-supination or wrist flexion-extension movements, such as twisting a towel or bouncing a ball. Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual.

Usual care (N = 12)

75 minutes of training, 3 times weekly for 8 consecutive weeks. 45 minutes of conventional task-oriented approach with bilateral symmetric movement training. The movement training involved grasping, manipulating and picking up and placing objects. After this people took part in the same 30 minutes of functional practice as the other groups. Concomitant therapy: All people received an injection of botulinum toxin type A (50 U/mL diluted in 0.9% saline injected into the target muscle confirmed by ultrasound). Concurrent use of muscle relaxants, antispastic agents and drugs having muscle relaxant properties was maintained at constant dosages throughout the study. All other routine rehabilitation that did not involve upper extremity training proceeded as usual.

Characteristics

Arm-level characteristics

Characteristic	Robot arm training (N = 13)	Mirror therapy (N = 12)	Usual care (N = 12)
% Female Sample size	n = 3 ; % = 23	n = 5 ; % = 42	n = 5 ; % = 42
Mean age (SD) (years) Mean (SD)	47.68 (12.79)	44.34 (10.05)	49.71 (10.86)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Robot arm training (N = 13)	Mirror therapy (N = 12)	Usual care (N = 12)
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA	n = NA ; % = NA
Haemorrhagic Sample size	n = 5 ; % = 38.5	n = 6 ; % = 50	n = 5 ; % = 41.7
Ischaemic Sample size	n = 8 ; % = 61.5	n = 6 ; % = 50	n = 7 ; % = 58.3
Time period since stroke (Months) Mean (SD)	33.38 (22.71)	33.08 (16.98)	38.17 (25.02)

Outcomes

Study timepoints

- Baseline
- 8 week (End of intervention)
- 5 month (Robot arm therapy review only)

Continuous outcomes

Outcome	Robot arm training, Baseline, N = 13	Robot arm training, 8 week, N = 13	Robot arm training, 5 month, N = 13	Mirror therapy, Baseline, N = 12	Mirror therapy, 8 week, N = 12	Mirror therapy, 5 month, N = 12	Usual care, Baseline, N = 12	Usual care, 8 week, N = 12	Usual care, 5 month, N = 12
Upper limb and hand motor function (Motor Activity Log) Scale range: 0-5. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Motor Activity Log - Amount of use Scale range: 0-5. Final values. Mean (SD)	1.47 (0.54)	1.81 (0.7)	1.78 (0.8)	1.41 (0.55)	1.98 (0.94)	1.69 (0.97)	1.01 (0.4)	1.54 (0.55)	1.56 (0.58)
Motor Activity Log - Quality of Movement Scale range: 0-5. Final values. Mean (SD)	0.94 (0.54)	1.26 (0.74)	1.22 (0.82)	0.88 (0.64)	1.35 (0.9)	1.24 (1)	0.52 (0.33)	1.03 (0.65)	1.08 (0.7)
Fugl-Meyer Assessment Upper Extremity (total) Scale range: 0-66. Final values.	32.92 (7.12)	36.46 (8.88)	34.92 (7.25)	32.67 (7.92)	35.91 (6.48)	34.92 (8.49)	29.67 (11.15)	32.91 (12.07)	33.75 (11)

Outcome	Robot arm training, Baseline, N = 13	Robot arm training, 8 week, N = 13	Robot arm training, 5 month, N = 13	Mirror therapy, Baseline, N = 12	Mirror therapy, 8 week, N = 12	Mirror therapy, 5 month, N = 12	Usual care, Baseline, N = 12	Usual care, 8 week, N = 12	Usual care, 5 month, N = 12
Mean (SD)									

Upper limb and hand motor function (Motor Activity Log) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity (total) - Polarity - Higher values are better

Dichotomous outcome

Outcome	Robot arm training, Baseline, N = 13	Robot arm training, 8 week, N = 13	Robot arm training, 5 month, N = 13	Mirror therapy, Baseline, N = 12	Mirror therapy, 8 week, N = 12	Mirror therapy, 5 month, N = 12	Usual care, Baseline, N = 12	Usual care, 8 week, N = 12	Usual care, 5 month, N = 12
Dropout rate No of events	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Upperlimbandhandmotorfunction(MotorActivityLog)-MotorActivityLog-Amountofuse-MeanSD-Robot arm training-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Upperlimbandhandmotorfunction(MotorActivityLog)-MotorActivityLog-Amountofuse-MeanSD-Robot arm training-Mirror therapy-Usual care-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Upperlimbandhandmotorfunction(MotorActivityLog)-MotorActivityLog-QualityofMovement-MeanSD-Robot arm training-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Upperlimbandhandmotorfunction(MotorActivityLog)-MotorActivityLog-QualityofMovement-MeanSD-Robot arm training-Mirror therapy-Usual care-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity(total)-MeanSD-Robot arm training-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity(total)-MeanSD-Robot arm training-Mirror therapy-Usual care-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Robot arm training-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Robot arm training-Mirror therapy-Usual care-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Hyun-Gyu, 2016

Bibliographic Reference	Hyun-Gyu, Cha; Duck-Won, Oh; Effects of mirror therapy integrated with task-oriented exercise on the balance function of patients with poststroke hemiparesis: a randomized-controlled pilot trial; International journal of rehabilitation research. Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation; 2016; vol. 39 (no. 1); 70-76

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with	No additional information.

this study included in review	
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Stroke onset duration of more than 6 months; no neurological deficits in the cerebellum or the brainstem; no hemineglect or visual field deficits; no cognitive problems (>24 points in the Mini-Mental State Examination); independent walking (with or without walking aids).
Exclusion criteria	No additional information.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=13 Mirror therapy with a task-oriented exercise program for 30 minutes, twice a day, five times a week for a period of 4 weeks. The mirror was 5 x 3m in the therapy room.
Comparator	Usual care N=12 Task-oriented exercise program only.
Number of participants	25.
Duration of follow-up	4 weeks.

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 13)

Mirror therapy with a task-oriented exercise program for 30 minutes, twice a day, five times a week for a period of 4 weeks. The mirror was 5 x 3m in the therapy room.

Usual care (N = 12)

Task-oriented exercise program only.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 13)	Usual care (N = 12)
% Female Nominal	6	5
Mean age (SD) Mean (SD)	60 (3.19)	58.6 (4.08)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	3	2
Haemorrhage Nominal	7	8
Time period since stroke (Months) Mean (SD)	14.8 (2.44)	16.4 (2.31)

Characteristic	Mirror therapy (N = 13)	Usual care (N = 12)
Left Nominal	*empty data*	5
Right Nominal	6	5

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 13	Mirror therapy, 4 week, N = 13	Usual care, Baseline, N = 12	Usual care, 4 week, N = 12
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Final value. Mean (SD)	34.8 (2.97)	47.8 (3.97)	32.6 (2.72)	39.2 (2.9)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 13	Mirror therapy, 4 week, N = 13	Usual care, Baseline, N = 12	Usual care, 4 week, N = 12
Dropouts Intervention: 3 dropouts (irregular participation in the intervention). Control: 2 dropouts (irregular participation in the intervention). Nominal	NA	3	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Lowerlimbmotorfunction(BergBalanceScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Ikizler May, 2020

Bibliographic Reference	Ikizler May, H.; Ozdolap, S.; Mengi, A.; Sarikaya, S.; The effect of mirror therapy on lower extremity motor function and ambulation in post-stroke patients: A prospective, randomized-controlled study; Turkish Journal of Physical Medicine and Rehabilitation; 2020; vol. 66 (no. 2); 154-160

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Turkey.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	No financial support was received for the research and/or authorship of the article.
Inclusion criteria	Experienced a stroke within the previous year; baseline Brunnstrom Stage 1-4; being ambulatory before the stroke.

Exclusion criteria	The presence of any cognitive disorder that could affect the study results; a history of recurrent stroke; any visual disorder that could affect vision of the image in the mirror; having neglect, apraxia, aphasia and psychological or emotional problems.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=21 30 minutes of mirror therapy per session in addition to usual care.
Comparator	Usual care N=21 Conventional rehabilitation program for four weeks consisting of 60 to 120 minutes/day for five days a week. Included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.
Number of participants	42.
Duration of follow-up	4 weeks (additional follow up for 12 weeks).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 21)

30 minutes of mirror therapy per session in addition to usual care.

Usual care (N = 21)

Conventional rehabilitation program for four weeks consisting of 60 to 120 minutes/day for five days a week. Included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 21)	Usual care (N = 21)
% Female Nominal	6	11

Characteristic	Mirror therapy (N = 21)	Usual care (N = 21)
Mean age (SD) Mean (SD)	57.2 (7.6)	58.8 (9.8)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	*empty data*	NR
Thromboembolic Nominal	19	16
Haemorrhagic Nominal	2	5
Time period since stroke (days) Range	15 to 365	15 to 300
Time period since stroke (days) Median (IQR)	60 (NR to NR)	30 (NR to *empty data*)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 21	Mirror therapy, 4 week, N = 21	Usual care, Baseline, N = 21	Usual care, 4 week, N = 21
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Final value. Mean (SD)	12 (9.3)	36.1 (9)	8.6 (12.3)	14.9 (13.8)
Motor impairment (Brunnstrom stages) Scale range: 1-7. Final value. Mean (SD)	2.4 (1.1)	4.1 (1)	2.4 (1.1)	3 (1.2)
Activities of daily living (Functional independence measure total) Scale range: 18-126. Final value. Mean (SD)	70.1 (19.7)	105.2 (12.8)	58.6 (21.6)	69.9 (22.1)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Motor impairment (Brunnstrom stages) - Polarity - Higher values are better

Activities of daily living (Functional independence measure total) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 21	Mirror therapy, 4 week, N = 21	Usual care, Baseline, N = 21	Usual care, 4 week, N = 21
Dropouts Nominal	*empty data*	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Lowerlimbmotorfunction(BergBalanceScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorimpairment(Brunnstromstages)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(Functionalindependencemeasuretotal)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

In, 2012

Bibliographic Reference	In, Tae Sung; Jung, Kyung Sim; Lee, Seung Won; Song, Chang Ho; Virtual reality reflection therapy improves motor recovery and motor function in the upper extremities of people with chronic stroke; Journal of Physical Therapy Science; 2012; vol. 24 (no. 4); 339-343

Study details

Secondary publication of another included study- see primary study for details	No additional information.

Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Onset of stroke at least 6 months prior to study, able to understand and follow simple verbal instructions, MMSE > 21, Brunnstrom stages 1 - 4.
Exclusion criteria	Apraxia, hemineglect, orthopaedic conditions or digital neuropathy in upper extremities.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=14 Virtual mirror therapy: affected arm lay in a box with a monitor positioned on the box, the unaffected arm was positioned under a camera, looking on the screen while performing movements of both arms, supervision of caregivers. 4 weeks, 5 days a week, 30 minutes additional virtual reality (VR) reflection therapy. Concomitant therapy: conventional stroke rehabilitation programme.
Comparator	Sham therapy N=10

	Additional sham therapy (same treatment, but the monitor was off). 4 weeks, 5 days a week, 30 minutes of additional sham therapy. Concomitant therapy: conventional stroke rehabilitation programme
Number of participants	24
Duration of follow-up	4 weeks (end of intervention)
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 14)

Virtual mirror therapy: affected arm lay in a box with a monitor positioned on the box, the unaffected arm was positioned under a camera, looking on the screen while performing movements of both arms, supervision of caregivers. 4 weeks, 5 days a week, 30 minutes additional virtual reality (VR) reflection therapy. Concomitant therapy: conventional stroke rehabilitation programme.

Sham therapy (N = 10)

Additional sham therapy (same treatment, but the monitor was off). 4 weeks, 5 days a week, 30 minutes of additional sham therapy. Concomitant therapy: conventional stroke rehabilitation programme

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 10)
% Female Nominal	4	4
Mean age (SD) (years) Mean (SD)	63.45 (11.78)	64.5 (12.69)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 10)
Severity Nominal	NR	NR
Haemorrhage Nominal	4	5
Ischaemia Nominal	7	3
Time period since stroke (Months) Mean (SD)	14 (4.88)	12.75 (6.78)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 4 week, N = 11	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 8
Upper limb and hand motor function (Manual function test) Scale range: 0-32. Final value. Mean (SD)	18.73 (4.8)	22.36 (3.98)	20.71 (4.46)	21 (4.97)
Fugl-Meyer Upper Extremity motor Scale range: 0-66. Final value. Mean (SD)	49.09 (11.53)	59.45 (7.42)	46.57 (11.89)	49.57 (12.95)

Upper limb and hand motor function (Manual function test) - Polarity - Higher values are better

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - Dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 4 week, N = 14	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 10
Dropouts Nominal	NA	3	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-Continuousoutcomes-Upperlimbandhandmotorfunction(Manualfunctiontest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-Continuousoutcomes-Fugl-MeyerUpperExtremitymotor-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-Dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

In, 2016

Bibliographic Reference	In, Taesung; Lee, Kyeongjin; Song, Changho; Virtual reality reflection therapy improves balance and gait in patients with chronic stroke: randomized controlled trials; Medical science monitor: international medical journal of experimental and clinical research; 2016; vol. 22; 4046

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Republic of Korea
Study setting	Inpatient rehabilitation centre
Study dates	NR
Sources of funding	NR
Inclusion criteria	Onset of stroke at least 6 months prior to study; were able to understand and follow simple verbal instructions; had a MMSE score over 21; had a Brunnstrom score between stages I and IV
Exclusion criteria	No apraxia or hemineglect; had no orthopaedic and neurologic conditions such as fractures and digital neuropathy on their lower extremities

Recruitment / selection of participants	NR
Intervention(s)	4 weeks, 5 days a week, 30 minutes virtual reality (VR) reflection therapy/mirror therapy: affected leg stood in a box with a monitor positioned on the box, the unaffected leg was positioned under a camera, looked on the screen while performing movements of both legs, supervision of caregivers. Plus 4 weeks, 5 days a week, 30 minutes conventional stroke rehabilitation programme
Comparator	4 weeks, 5 days a week, 30 minutes virtual reality (VR) reflection sham therapy (same treatment as intervention group but the monitor was off), supervision of caregivers. Plus 4 weeks, 5 days a week, 30 minutes conventional stroke rehabilitation programme
Number of participants	30
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

virtual reality mirror therapy (N = 15)

Sham virtual reality mirror therapy (N = 15)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 25)**
% Female Nominal	10
Mean age (SD) Mean (SD)	59.5 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Characteristic	Study (N = 25)
Type of stroke ischemic Nominal	16
Time period since stroke (days) Nominal	13.1
side of paresis (left) Nominal	13

Outcomes

Study timepoints

- 4 week

4 week outcomes

Outcome	virtual reality mirror therapy, 4 week, N = 13	Sham virtual reality mirror therapy, 4 week, N = 12
motor function (berg balance scale) 0-56 Mean (SD)	49.1 (2.7)	46.1 (3)
Dropouts Nominal	2	3

motor function (berg balance scale) - Polarity - Higher values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Dropouts-Nominal-virtual reality mirror therapy-Sham virtual reality mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-motorfunction(bergbalancescale)-MeanSD-virtual reality mirror therapy-Sham virtual reality mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Invernizzi, 2013

Bibliographic Reference	Invernizzi, M; Negrini, S; Carda, S; Lanzotti, L; Cisari, C; Baricich, A; The value of adding mirror therapy for upper limb motor recovery of subacute stroke patients: a randomized controlled trial; Eur J Phys Rehabil Med; 2013; vol. 49 (no. 3); 311-317

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Italy
Study setting	inpatient rehabilitation centre
Study dates	October 2009 to August 2011
Sources of funding	NR
Inclusion criteria	hemiplegia after 1st stroke (diagnosed by CT scan) within 4 weeks post-stroke, absence of severe attentive deficits, presence of movement in shoulder/elbow/hand with Motricity score< 77
Exclusion criteria	haemorrhagic stroke, global aphasia and cognitive impairments that interfere with study or treatment participation (MMSE < 22), concomitant cns- or pns-disorder or myopathia
Recruitment / selection of participants	NR
Intervention(s)	Mirror Therapy: participants observed their unaffected upper limb in mirror while performing movements of the unaffected limb, self-selected speed, no additional verbal feedback. 5 days a week, 30 minutes of MT for 1st 2 weeks, 60 minutes of MT for the last 2 weeks. Plus usual rehabilitation programme 1 hour, 5 times a week

Comparator	Sham therapy: participants performed the same treatment protocol with a covered mirror 5 days a week, 30 minutes for 1st 2 weeks and 60 minutes of sham therapy for the last 2 weeks. Plus usual rehabilitation programme 1 hour, 5 times a week
Number of participants	26
Duration of follow-up	4 weeks
Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 13)

sham mirror therapy (N = 13)

Characteristics

Study-level characteristics

Characteristic	Study (N = 26)
% Female Nominal	9
Mean age (SD) Mean (SD)	66.6 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Characteristic	Study (N = 26)
Type of stroke ischemic Nominal	26
Time period since stroke days Nominal	23
side of paresis (left) Nominal	13

Outcomes

Study timepoints

- 4 week

4 week outcomes

Outcome	mirror therapy, 4 week, N = 13	sham mirror therapy, 4 week, N = 12
Motor function (ARAT) Mean (SD)	47.64 (15.19)	33.67 (20.33)
motor impairment (motricity index) Mean (SD)	76 (21.78)	51.58 (24.74)

Outcome	mirror therapy, 4 week, N = 13	sham mirror therapy, 4 week, N = 12
Activities of daily living (FIM) Mean (SD)	93.2 (22.1)	67.4 (13.2)
Drop outs n=13, n=13 Nominal	0	1
Adverse events Nominal	0	0

Motor function (ARAT) - Polarity - Higher values are better

motor impairment (motricity index) - Polarity - Higher values are better

Activities of daily living (FIM) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Activitiesofdailyliving(FIM)-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Dropouts-Nominal-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Adverseevents-Nominal-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Motorfunction(ARAT)-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-motorimpairment(motricityindex)-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Ji, 2014

Bibliographic Reference	Ji, Sang-Goo; Cha, Hyun-Gyu; Kim, Myoung-Kwon; Stroke recovery can be enhanced by using repetitive transcranial magnetic stimulation combined with mirror therapy; Journal of Magnetics; 2014; vol. 19 (no. 1); 28-31

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Republic of Korea
Study setting	university hospital

Study dates	NR
Sources of funding	NR
Inclusion criteria	hemiparesis by stroke
Exclusion criteria	NR
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy, in conjunction with repetitive transcranial magnetic stimulation (rTMS) 15 minutes a day. Sessions involved flexion and extension of fingers, 10 Hz rTMS was applied to the hotspot of the lesional hemisphere in 10-second trains, with 50-second intervals between trains. Mirror therapy. Sessions involved flexion and extension of fingers wrist extension of non-paretic upper extremity consisting of daily 4 times for 15 minutes a session. All subjects were conducted with traditional physical therapy for 30 minutes a day, 5 times a week, for 6 weeks. Traditional physical therapy consisted of neurodevelopment treatment.
Comparator	Sham therapy using a covered mirror: same movements as in Mirror therapy. 15 mins a day. All subjects were conducted with traditional physical therapy for 30 minutes a day, 5 times a week, for 6 weeks. Traditional physical therapy consisted of neurodevelopment treatment.
Number of participants	35

Duration of follow-up	6 weeks
Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy + rTMS + mirror therapy alone group (combined) (N = 23)

study reports 3 arms but 2 MT arms have been combined in cochrane review with 12 and 11 in each arm

Sham mirror therapy (N = 12)

Characteristics

Study-level characteristics

Characteristic	Study (N = 35)
% Female Nominal	13
Mean age (SD) Mean (SD)	52.6 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischemic Nominal	19
Time period since stroke MONTHS Nominal	8.9
side of paresis (left) Nominal	14

Outcomes

6 week outcomes

Outcome	mirror therapy + rTMS + mirror therapy alone group (combined), , N = 23	Sham mirror therapy, , N = 12
Motor function (Box and Block Test) Mean (SD)	45.5 (12.4)	35.5 (10.9)
Motor impairment and Fugl-Meyer Assessment outcome (Fugl-Meyer Assessment upper extremity)) Mean (SD)	53.5 (9.6)	47.9 (8.5)

Motor function (Box and Block Test) - Polarity - Higher values are better

Motor impairment and Fugl-Meyer Assessment outcome (Fugl-Meyer Assessment upper extremity)) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-Motorfunction(BoxandBlockTest)-MeanSD-mirror therapy + rTMS + mirror therapy alone group (combined)-Sham mirror therapy

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy group with mirror therapy + rTMS)*

6weekoutcomes-MotorimpairmentandFugl-MeyerAssessmentoutcome(Fugl-MeyerAssessmentupperextremity))-MeanSD-mirror therapy + rTMS + mirror therapy alone group (combined)-Sham mirror therapy

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy group with mirror therapy + rTMS)*

Kang, 2017

Bibliographic Reference	Kang, J. A.; Chun, M. H.; Choi, S. J.; Chang, M. C.; Yi, Y. G.; Effects of Mirror Therapy Using a Tablet PC on Central Facial Paresis in Stroke Patients; Annals of rehabilitation medicine-arm; 2017; (no. 3); 347-353

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with	No additional information.

this study included in review	
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Korea.
Study setting	Rehabilitation unit.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Diagnosed with first unilateral hemispheric stroke confirmed by neuroimaging examinations, computer tomography, and/or magnetic resonance imaging; transferred to the Department of Rehabilitation Medicine within 12 weeks of stroke onset; able to understand the study design, as screened by the ability to follow a three-step command.
Exclusion criteria	Those regarded as peripheral facial palsy: without forehead movement, and/or lesion at facial motor nuclear in CT and/or MRI; those with visual disturbances, or those who could not distinguish their face reflected in the mirror, or had hemispatial neglect; those with a history of facial palsy of the central type and/or peripheral type; those diagnosed with total paralysis from stroke onset, having no ability to move the mouth.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Mirror therapy using a tablet PC while exercising. 15 minutes of orofacial exercise twice daily for 14 days.
Comparator	Usual care N=11 Exercises only.
Number of participants	21.

Duration of follow-up	2 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Other Facial
Subgroup analysis - further details	No additional information

Study arms

Mirror therapy (N = 10)

Mirror therapy using a tablet PC while exercising. 15 minutes of orofacial exercise twice daily for 14 days.

Usual care (N = 11)

Exercises only.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 10)	Usual care (N = 11)
% Female Nominal	4	4
Mean age (SD) Mean (SD)	63.1 (10.3)	55.6 (16)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Mean (SD)	22.8 (4.2)	25.6 (4.4)
Ischaemic Nominal	9	11
Haemorrhagic Nominal	1	0

Characteristic	Mirror therapy (N = 10)	Usual care (N = 11)
Time period since stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 2 week, N = 10	Usual care, Baseline, N = 11	Usual care, 2 week, N = 11
Motor impairment (regional House-Brackmann facial nerve Grading System) Scale range: 1-6. Final value. Mean (SD)	3.2 (1.2)	NR (NR)	3.4 (1.1)	NR (NR)
Midface Mean (SD)	2.9 (0.7)	2.1 (1)	2.5 (0.5)	2.1 (0.7)
Mouth Mean (SD)	3.3 (1.6)	2.3 (1.6)	3.5 (1.1)	2.8 (1.3)

Motor impairment (regional House-Brackmann facial nerve Grading System) - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(regionalHouse-BrackmannfacialnerveGradingSystem)-Midface-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(regionalHouse-BrackmannfacialnerveGradingSystem)-Mouth-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kaviraja, 2021

Bibliographic Reference	Kaviraja, K.; Tharani, G.; Yuvarani, G.; Kaviraja, N.; Jenifer Augustina, S.; Aarthi, C.; Effects of mirror therapy vs modified constraint induced movement therapy on upper extremity in subacute stroke patients; Bangladesh Journal of Medical Science; 2021; vol. 20 (no. 2); 323-329

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	The Faculty of Physiotherapy (outpatient follow up).
Study dates	No additional information.
Sources of funding	Source of funding: Self.
Inclusion criteria	People with subacute stroke in upper limbs irrespective of gender and age group between 55-70 years.
Exclusion criteria	People with Mini Mental State Examination score <24; uncontrolled systemic hypertension; past stroke history; severe cardiac failure.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Mirror therapy 5 days a week for a duration of 30 minutes. People were made to sit near a table with a mirror placed vertically in mid sagittal plane. The paretic limb was positioned behind the mirror and normal limb was placed parallel to the mirror. Simple movements such as finger flexion, extension, adduction and abduction, wrist flexion, extension, ulnar and

	radial deviation were encouraged. People were asked to see the reflection on the mirror and similar movements were stimulated over the paretic limb.
Comparator	Usual care N=15 Modified constrain induced movement therapy 5 days a week for a duration of 30 minutes. In this group patient's non paretic limb was constraint using a sling. The same movements were performed in the paretic limb. People were instructed to constraint their non paretic limb for around 6 hours a day.
Number of participants	30.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Mirror therapy 5 days a week for a duration of 30 minutes. People were made to sit near a table with a mirror placed vertically in mid sagittal plane. The paretic limb was positioned behind the mirror and normal limb was placed parallel to the mirror. Simple movements such as finger flexion, extension, adduction and abduction, wrist flexion, extension, ulnar and radial deviation were encouraged. People were asked to see the reflection on the mirror and similar movements were stimulated over the paretic limb.

Usual care (N = 15)

Modified constrain induced movement therapy 5 days a week for a duration of 30 minutes. In this group patient's non paretic limb was constraint using a sling. The same movements were performed in the paretic limb. People were instructed to constraint their non paretic limb for around 6 hours a day.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
% Female Nominal	NR
Mean age (SD) Range	55 to 70
Ethnicity	NR

Characteristic	Study (N = 30)
Nominal	
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke (month) Range	2 to 12

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Usual care, Baseline, N = 15	Usual care, 4 week, N = 15
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final values. Mean (SD)	28.4 (6.87)	34 (6.53)	25.73 (7.01)	42.13 (5.4)
Upper limb motor function (upper extremity functional index scale) Scale range: 0-80. Final values. Mean (SD)	16.26 (6.51)	22 (7.05)	15.93 (5.53)	28.86 (6.25)

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Upper limb motor function (upper extremity functional index scale) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(upperextremityfunctionalindexscale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kawakami, 2015

Bibliographic Reference	Kawakami, Kenji; Miyasaka, Hiroyuki; Nonoyama, Sayaka; Hayashi, Kazuya; Tonogai, Yusuke; Tanino, Genichi; Wada, Yosuke; Narukawa, Akihisa; Okuyama, Yuko; Tomita, Yutaka; Randomized controlled comparative study on effect of training to improve lower limb motor paralysis in convalescent patients with post-stroke hemiplegia; Journal of physical therapy science; 2015; vol. 27 (no. 9); 2947-2950

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR

Study location	Japan
Study setting	inpatient rehabilitation centre
Study dates	September 2009 to July 2011
Sources of funding	NR
Inclusion criteria	hemiplegia following initial supratentorial stroke, admitted to a convalescent rehabilitation ward
Exclusion criteria	time to admission from the onset is within 14 days, difficult communication due to severe cognitive disorder, comorbidity index of 4 or higher, necessity of high-level consideration and caution for rehabilitation, and scores of hip-flexion, knee-extension, and foot-pat items of the Stroke Impairment Assessment Set (SIAS) lower than 2
Recruitment / selection of participants	NR
Intervention(s)	1. MT: dorsiflexion of the ankle joint, stepping over, and abduction/adduction of the hip joint with the non-affected limb 2. Integrated volitional control electrical stimulation (IVES): 50 □s pulse width, 20 Hz frequency bidirectional square waves was applied at an intensity proportional to the voluntary myoelectric activity lev-el on the paralytic side for dorsiflexion of the ankle joint and extension of the knee joint 3. Therapeutic electrical stimulation (TES): 50s pulse width, 20 Hz frequency bidirectional square waves applied at the maximum acceptable intensity during 10 minutes each of paralytic ankle dorsi-flexion and knee extension 4. Repetitive facilitating exercises (RFE): participants performed ankle dorsiflexion 100 or more times during a 10-minute period in a supine position using manual tapping stimulation, additional performance of hip flexion-extension exercise, abduction-adduction exercise, extension/abduction-flex-ion/adduction exercise, and hip extension/abduction/retention of external rotation/knee extension hip flexion/adduction/external rotation/knee flexion exercise

	All groups received; 4 weeks, 1 hour a day standard rehabilitation programme. All groups received 20 minutes of the assigned treatment within conventional physiotherapy
Comparator	5. Control group: training programme of ROM and ADL exercises. All groups received; 4 weeks, 1 hour a day standard rehabilitation programme. All groups received 20 minutes of the assigned treatment within conventional physiotherapy
Number of participants	81
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear

Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 16)

mix of interventions (N = 65)

cochrane review combines the 3 interventions below + control to make up the comparator group

Characteristics

Study-level characteristics

Characteristic	**Study (N = 81)**
% Female Nominal	24
Mean age (SD) Mean (SD)	64.1 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR

Characteristic	Study (N = 81)
Severity Nominal	NR
Type of stroke ischemic Nominal	28
Time period since stroke days Nominal	32.3
side of paresis (left) Nominal	28

Outcomes

Study timepoints

- 4 week

4 week outcome

Outcome	Mirror therapy, 4 week, N = 19	mix of interventions, 4 week, N = 65
Drop outs Nominal	3	11

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcome-Dropouts-Nominal-Mirror therapy-mix of interventions-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(cochrane review combines all alternative interventions with the control group and compares to Mirror therapy)*

Kim, 2022

Bibliographic Reference	Kim, H; Kim, J; Jo, S; Lee, K; Kim, J; Song, C; Video augmented mirror therapy for upper extremity rehabilitation after stroke: a randomized controlled trial; Journal of neurology; 2022

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with	No additional information.

this study included in review	
Trial name / registration number	KCT0003047
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Outpatient follow up.
Study dates	October to December 2017.
Sources of funding	This research was supported by a grant of the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI), funded by the Ministry of Health & Welfare, Republic of Korea (grant number: HI21C0572).
Inclusion criteria	First stroke with hemiplegia during the previous 12 months; ability to understand and follow simple verbal instructions; Korean version of the Mini-mental State Examination score at least 21 points; mild to moderate motor impairment (total FMA upper extremity scores of 26-56).
Exclusion criteria	Psychiatric disorders of dementia; orthopedic disorders; apraxia or hemineglect; people with previous experience of mirror therapy.
Recruitment / selection of participants	Recruited from the N hospital in Gyeonggi-do by publicizing the research purpose and inclusion criteria.
Intervention(s)	Mirror therapy N=28 Two groups combined, both providing therapy for 30 minutes/day, 5 times a week for 4 weeks in addition to usual care. One group (n=14) received mirror therapy through a video augmented wearable reflection device, one group (n=14) received traditional mirror therapy. The video augmented mirror therapy group received mirror therapy with the use of a device equipped with a tablet personal computer on top of four wheels at the bottom to enable people to easily move their affected arm. Before starting therapy people were video recorded while performing 11 tasks. The captured images were left-right reversed to create an image of the affected upper extremity. The therapists explained the procedure prior to each task. Participants were asked to move their affected upper extremities simultaneously while watching the image of the produced program so they could experience visual illusions in which they might thick the hands on the screen were their actual hands. The tasks consisted of 11 movements followed by a brief explanation of the therapy process for first 5 minutes.

	Each operation was repeated 20 times. The traditional mirror therapy group underwent the same exercises but using a mirror between the arms instead of a tablet PC. People were seated in a chair or a wheelchair with a mirror placed vertically on the table in front of them. The unaffected arm was placed in front of the mirror while the unaffected arm was placed behind them. Otherwise the procedure was the same. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.
Comparator	Usual care N=14 Usual care only. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.
Number of participants	42
Duration of follow-up	4 weeks (end of the intervention)
Additional comments	Method of analysis unclear. Appears to be completers only.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 28)

Two groups combined, both providing therapy for 30 minutes/day, 5 times a week for 4 weeks in addition to usual care. One group (n=14) received mirror therapy through a video augmented wearable reflection device, one group (n=14) received traditional mirror therapy. The video augmented mirror therapy group received mirror therapy with the use of a device equipped with a tablet personal computer on top of four wheels at the bottom to enable people to easily move their affected arm. Before starting therapy people were video recorded while performing 11 tasks. The captured images were left-right reversed to create an image of the affected upper extremity. The therapists explained the procedure prior to each task. Participants were asked to move their affected upper extremities simultaneously while watching the image of the produced program so they could experience visual illusions in which they might thick the hands on the screen were their actual hands. The tasks consisted of 11 movements followed by a brief explanation of the therapy process for first 5 minutes. Each operation was repeated 20 times. The traditional mirror therapy group underwent the same exercises but using a mirror between the arms instead of a tablet PC. People were seated in a chair or a wheelchair with a mirror placed vertically on the table in front of them. The unaffected arm was placed in front of the mirror while the unaffected arm was placed behind them. Otherwise the procedure was the same. Concomitant therapy: Conventional rehabilitation consisting of physical and

occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.

Usual care (N = 14)

Usual care only. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 28)**	**Usual care (N = 14)**
% Female Sample size	n = 9 ; % = 32	n = 4 ; % = 33
Mean age (SD) (years) Mean (SD)	60.29 (5.69)	58.75 (3.44)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Mirror therapy (N = 28)	Usual care (N = 14)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	6.88 (2.55)	6.67 (2.35)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 24	Mirror therapy, 4 week, N = 24	Usual care, Baseline, N = 12	Usual care, 4 week, N = 12
Upper limb and hand motor function (Box and block test) (number of blocks transferred in 60 seconds) Final values. Electronic mirror therapy: 19.92 (6.49). Traditional mirror therapy: 18.67 (5.10). Mean (SD)	15.44 (5.71)	19.5 (6.09)	14.58 (4.1)	16.33 (4.12)

Outcome	Mirror therapy, Baseline, N = 24	Mirror therapy, 4 week, N = 24	Usual care, Baseline, N = 12	Usual care, 4 week, N = 12
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
FMA Shoulder, elbow and forearm Scale range: 0-36. Final values. Electronic mirror therapy: 32.33 (3.80). Traditional mirror therapy: 30.25 (2.83). Mean (SD)	27.34 (4.22)	31.29 (3.51)	27.67 (4.77)	29.42 (4.87)
FMA Wrist Scale range: 0-10. Final values. Electronic mirror therapy: 7.75 (2.18). Traditional mirror therapy: 6.83 (1.85). Mean (SD)	5.42 (1.44)	7.29 (2.07)	5.33 (1.56)	6 (1.28)
FMA Hand Scale range: 0-14. Final values. Electronic mirror therapy: 9.17 (2.21). Traditional mirror therapy: 9.33 (2.35). Mean (SD)	6.92 (1.54)	9.25 (2.28)	7.25 (1.29)	8 (1.04)
FMA Coordination Scale range: 0-6. Final values. Electronic mirror therapy: 3.75 (1.22). Traditional mirror therapy: 3.83 (0.83). Mean (SD)	3.04 (0.88)	3.79 (1.04)	3.25 (0.75)	3.67 (0.89)

Upper limb and hand motor function (Box and block test) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 28	Mirror therapy, 4 week, N = 28	Usual care, Baseline, N = 14	Usual care, 4 week, N = 14
Dropout rate Intervention: 2 discharged, 1 low participation, 1 refused to participate. Control: 2 discharged. No of events	n = NA ; % = NA	n = 4 ; % = 14	n = NA ; % = NA	n = 2 ; % = 14

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Upperlimbandhandmotorfunction(Boxandblocktest)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-FMAShoulder,elbowandforearm-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-FMAWrist-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-FMAHand-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-FMACoordination-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcome-Dropoutrate-NoOfEvents-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2014

Bibliographic Reference	Kim, HyunJin; Lee, GyuChang; Song, ChangHo; Effect of functional electrical stimulation with mirror therapy on upper extremity motor function in poststroke patients; Journal of Stroke and Cerebrovascular Diseases; 2014; vol. 23 (no. 4); 655-661

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	University hospital.
Study dates	1st July to 31st July 2013.
Sources of funding	Sahmyook University.

Inclusion criteria	Onset of stroke within 6 months, MMSE > 21, FMA upper extremity score < 44, Brunnstrom recovery stage 1 - 4, absence of orthopaedic disease in the upper extremity, no visual perception disorder (unilateral neglect, hemianopsia, apraxia), no pacemaker, no anticonvulsant medication, medically stable condition
Exclusion criteria	Not stated.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=14 Additional mirror therapy and functional electrical stimulation: participants observed their unaffected upper limb in a mirror while performing extension of wrist and fingers to lift the hand from an FES switch, at the same time attempt to extend affected hand supported by electrical stimulation (20 Hz), pulse rate 300 microseconds, individual intensity for muscle contraction and complete extension for an additional 5 days a week, 30 minutes a day, 4 weeks. Concomitant therapy: Usual rehabilitation treatment 60 minutes/day, 5 times/week, 4 weeks usual rehabilitation treatment.
Comparator	Sham therapy N=13 Additional sham therapy and functional electrical stimulation: The same treatment protocol as group 1, while looking on the non-reflecting surface of the mirror for an additional 5 days a week, 30 minutes a day, 4 weeks. Concomitant therapy: Usual rehabilitation treatment 60 minutes/day, 5 times/week, 4 weeks usual rehabilitation treatment.
Number of participants	27
Duration of follow-up	4 weeks (end of intervention).
Additional comments	No additional information.

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Mixed
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 14)

Additional mirror therapy and functional electrical stimulation: participants observed their unaffected upper limb in a mirror while performing extension of wrist and fingers to lift the hand from an FES switch, at the same time attempt to extend affected hand supported by electrical stimulation (20 Hz), pulse rate 300 microseconds, individual intensity for muscle contraction and complete extension for an additional 5 days a week, 30 minutes a day, 4 weeks. Concomitant therapy: Usual rehabilitation treatment 60 minutes/day, 5 times/week, 4 weeks usual rehabilitation treatment.

Sham therapy (N = 13)

Additional sham therapy and functional electrical stimulation: The same treatment protocol as group 1, while looking on the non-reflecting surface of the mirror for an additional 5 days a week, 30 minutes a day, 4 weeks. Concomitant therapy: Usual rehabilitation treatment 60 minutes/day, 5 times/week, 4 weeks usual rehabilitation treatment.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 13)
% Female Nominal	5	4
Mean age (SD) Mean (SD)	55.92 (11.75)	55.64 (12.61)
Ethnicity Nominal	NR	NR
Hypertension Nominal	8	9
Dyslipidaemia Nominal	3	2
Diabetes mellitus Nominal	4	2

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 13)
Upper extremity Mean (SD)	1.67 (0.65)	1.64 (0.67)
Hand Mean (SD)	1.83 (0.72)	1.64 (0.81)
Middle cerebral artery Nominal	4	5
Basal ganglia Nominal	3	2
Midbrain Nominal	1	1
Frontal lobe Nominal	1	1
Internal capsule Nominal	1	0
Corona radiate Nominal	1	1
Pons Nominal	1	1

Characteristic	Mirror therapy (N = 14)	Sham therapy (N = 13)
Time period since stroke (days) Mean (SD)	34.06 (1.65)	35 (15.05)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 4 week, N = 12	Sham therapy, Baseline, N = 13	Sham therapy, 4 week, N = 11
Upper limb motor function (Manual Function Test) Shoulder function and hand functions combined. Scale range: Unclear. Final values. Mean (SD)	NR (NR)	12.4 (3.5)	NR (NR)	9.6 (2.7)
Fugl-Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final values. Mean (SD)	NR (NR)	26.7 (8.7)	NR (NR)	17.5 (5.7)

Upper limb motor function (Manual Function Test) - Polarity - Higher values are better

Fugl-Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 4 week, N = 14	Sham therapy, Baseline, N = 13	Sham therapy, 4 week, N = 13
Dropouts Nominal	NA	2	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcome-Upperlimbmotorfunction(ManualFunctionTest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcome-Fugl-MeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2017

Bibliographic Reference	Kim, J. H.; Lee, B.; The effect of mirror therapy on functional recovery of upper extremity after stroke: a randomized pilot study; Journal of experimental stroke & translational medicine; 2017; vol. 9 (no. 1nopagination)

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.

Study setting	No additional information.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Those who had a stroke at least 6 months earlier; obtained 25 points or more in a Mini Mental State Examination (MMSE); were at Brunnstrom motor recovery stage level 1-4; obtained 44 points or more in a Fugl-Meyer Assessment; understood the purpose of the present study; agreed to participate in the experiment.
Exclusion criteria	Those who could not smoothly implement the experiment due to deteriorated vision; serious cognitive decline; aphasia; those who had neurologic or musculoskeletal damage (fracture, balance disorder) not caused by stroke; those who had hemi-neglect.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Mirror therapy. Comfortably sitting on a chair, people put their paretic arm into the mirror box (24cm x 35cm x 24cm). Physical training for an average of 35.6 (4.17) minutes 20.6 (4.17) times over the treatment time (five days a week for 4 weeks). Exercise included elbow, wrist, and finger flexion and extension, forearm supination and pronation, finger calculating, opposition, and elbow flexion and extension on a table edge and object-related movements for 20 minutes including sponge squeezing, wrist flexion and extension with a bold held in the hand, swiping a table with a towel, peg board, transferring a bean using spoon, and typing a keyboard.
Comparator	Sham therapy N=10 Same exercises completed using a mirror box placed so that nothing would be seen on the surface and instructing the people to watch a nature documentary video not related to the movements in the program.
Number of participants	20.
Duration of follow-up	4 weeks.
Additional comments	No additional information.

Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 10)

Mirror therapy. Comfortably sitting on a chair, people put their paretic arm into the mirror box (24cm x 35cm x 24cm). Physical training for an average of 35.6 (4.17) minutes 20.6 (4.17) times over the treatment time (five days a week for 4 weeks). Exercise included elbow, wrist, and finger flexion and extension, forearm supination and pronation, finger calculating, opposition, and elbow flexion and extension on a table edge and object-related movements for 20 minutes including sponge squeezing, wrist flexion and extension with a bold held in the hand, swiping a table with a towel, peg board, transferring a bean using spoon, and typing a keyboard.

Sham therapy (N = 10)

Same exercises completed using a mirror box placed so that nothing would be seen on the surface and instructing the people to watch a nature documentary video not related to the movements in the program.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 10)	Sham therapy (N = 10)
% Female Nominal	3	3
Mean age (SD) Mean (SD)	54.1 (9.34)	54.56 (9.28)
Ethnicity Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	7	6
Haemorrhage Nominal	3	3
Time period since stroke (day)	369.6 (189.64)	427.89 (182.33)

Characteristic	Mirror therapy (N = 10)	Sham therapy (N = 10)
Mean (SD)		
Left Nominal	6	7
Right Nominal	4	2

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 9
Upper limb motor function (Box and Block Test) (number of blocks placed in the other partition) Final values Mean (SD)	10.05 (3.5)	12.9 (3.31)	10.44 (3.91)	11.89 (3.72)
Motor impairment (grip strength) (kg) Final values Mean (SD)	9.73 (5.12)	11.88 (5.32)	8.11 (2.62)	9.16 (2.8)

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 9
Activities of daily living (Function Independence Measure Self Care) Scale range: unclear. Final values. Mean (SD)	26.4 (2.91)	29.5 (2.17)	25.78 (3.07)	27.33 (3.08)

Upper limb motor function (Box and Block Test) - Polarity - Higher values are better

Motor impairment (grip strength) - Polarity - Higher values are better

Activities of daily living (Function Independence Measure Self Care) - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 4 week, N = 10
Dropouts Nominal	NA	0	NA	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Motorimpairment(gripstrength)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Activitiesofdailyliving(FunctionIndependenceMeasureSelfCare)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2018

Bibliographic Reference	Kim, J.; Yim, J.; Effects of High-Frequency Repetitive Transcranial Magnetic Stimulation Combined with Task-Oriented Mirror Therapy Training on Hand Rehabilitation of Acute Stroke Patients; Medical Science Monitor; 2018; vol. 24; 743-750

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Symptoms of unilateral hemiparesis in ischaemic and haemorrhagic stroke patients; a Korean Mini Mental State Examination score of >25; absence of psychological and emotional abnormalities; inpatients within 3 months from the day of diagnosis of stroke; Manual muscle testing grade of upper extremity of paralyzed side is less than F-grade; those who agree to want to participate in the research.

Exclusion criteria	Patients with pacemakers or metal objects implanted in the head; patients with neglect symptoms or vision impairment; history of seizures; absence of a motor-evoked potential response upon applying rTMS to the damaged cerebral hemisphere; upper-limb function impairments on both sides due to orthopedic or neurologic causes.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=12 High frequency repetitive transcranial magnetic stimulation (applied at 20Hz over the hand motor area in the contex of the affected hemisphere for 15 minutes) combined with task-oriented mirror therapy training. Included 20 minutes of general exercise therapy and 15-minutes of HF-rTMS. The exercise program included joint mobility, eccentric and concentric contraction, and strengthening by automated full-body workout machine. The mirror therapy included a 15cm x 40 cm x 30 cm mirror. People were instructed to sit on a height-adjustable Bobath mattress without back support. The mirror box was placed such that it tilted toward the damaged side along the center line of the patient's trunk on a steady table. They were instructed to put the hand of the damaged side in the mirror box so that it could not be seen and to place the hand of the non-damaged side in front of the mirror. At a specific moment, people were instructed to voluntarily adjust the position of the hand inside the mirror box. People were instructed to gaze attentively at the image of the hand reflect in the mirror at the start of the program. This included 5 motions, including the box and block test, picking up sand, inserting a coin into a savings box, scooping sand with a spoon, and wiping with a towel. Training was conducted for 30 minutes. Interventions occurred 5 days/week for 2 weeks.
Comparator	Usual care N=12 High frequency repetitive transcranial magnetic stimulation and general exercise therapy only. Interventions occurred 5 days/week for 2 weeks.
Number of participants	24.
Duration of follow-up	2 weeks.
Additional comments	No additional information.

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 12)

High frequency repetitive transcranial magnetic stimulation (applied at 20Hz over the hand motor area in the contex of the affected hemisphere for 15 minutes) combined with task-oriented mirror therapy training. Included 20 minutes of general exercise therapy and 15-minutes of HF-rTMS. The exercise program included joint mobility, eccentric and concentric contraction, and strengthening by automated full-body workout machine. The mirror therapy included a 15cm x 40 cm x 30 cm mirror. People were instructed to sit on a height-adjustable Bobath mattress without back support. The mirror box was placed such that it tilted toward the damaged side along the center line of the patient's trunk on a steady table. They were instructed to put the hand of the damaged side in the mirror box so that it could not be seen and to place the hand of the non-damaged side in front of the mirror. At a specific moment, people were instructed to voluntarily adjust the position of the hand inside the mirror box. People were instructed to gaze attentively at the image of the hand reflect in the mirror at the start of the program. This included 5 motions, including the box and block test, picking up sand,

inserting a coin into a savings box, scooping sand with a spoon, and wiping with a towel. Training was conducted for 30 minutes. Interventions occurred 5 days/week for 2 weeks.

Usual care (N = 12)

High frequency repetitive transcranial magnetic stimulation and general exercise therapy only. Interventions occurred 5 days/week for 2 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 12)	Usual care (N = 12)
% Female Nominal	4	8
Mean age (SD) Mean (SD)	51 (2.98)	74.11 (2.88)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR

Characteristic	Mirror therapy (N = 12)	Usual care (N = 12)
Ischaemic Nominal	5	7
Haemorrhagic Nominal	3	5
Time period since stroke (month) Mean (SD)	1.63 (0.74)	1.75 (0.62)
Right Nominal	6	7
Left Nominal	2	5

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 2 week, N = 8	Usual care, Baseline, N = 12	Usual care, 2 week, N = 12
Upper limb motor function (Box and Block Test) (number of blocks placed in the other partition) Final values. Mean (SD)	8.25 (9.4)	30.87 (14.32)	14.81 (15.74)	20.45 (20.07)
Motor impairment (hand grip strength) (kg) Final values. Mean (SD)	5.43 (4.15)	15.37 (8.46)	5.45 (6.87)	10.81 (10.43)

Upper limb motor function (Box and Block Test) - Polarity - Higher values are better

Motor impairment (hand grip strength) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 2 week, N = 12	Usual care, Baseline, N = 12	Usual care, 2 week, N = 12
Dropouts Intervention: 2 scalp pain, 2 absent from training. Nominal	NA	4	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorimpairment(handgripstrength)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2015

Bibliographic Reference	Kim, Jung Hee; Lee, Byoung-Hee; Mirror therapy combined with biofeedback functional electrical stimulation for motor recovery of upper extremities after stroke: a pilot randomized controlled trial; Occupational therapy international; 2015; vol. 22 (no. 2); 51-60

Study details

Other publications associated with this study included in review	NR
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	inpatient rehabilitation centre
Study dates	NR
Sources of funding	NR
Inclusion criteria	onset of stroke > 6 months, MMSE > 25, absence of cognitive problems, BRS 1 – 4, andthe ability to understand the purpose of the study
Exclusion criteria	impaired vision, cognitive problems such as a severe decline in cognition or aphasia that would prevent normal progress in the experiment, neurological or musculoskeletal (fracture orbalance-related) disorders not caused by stroke, hemineglect
Recruitment / selection of participants	NR
Intervention(s)	1. MT with biofeedback functional electrical stimulation (BF-FES: EMG) placed to wrist extensor and brachial muscle of the upper extremity of the less affected side, FES electrode placed to wrist extensor of the affected side, input signal for EMG sensor sampled at 256 Hz, 5 s of electrical stimulation of the affected side after exceeding EMG threshold. MT with physiological and object-related movements.

	4 weeks, 5 days per week, 30 minutes a session 2. MT with FES: FES adjusted to a tolerable level while the participants were in a state of induced wrist extension every 5s. 4 weeks, 5 days per week, 30 minutes a session All groups received conventional rehabilitation programme -4 weeks, 5 days a week, 30 minutes a day
Comparator	conventional rehabilitation programme alone - 4 weeks, 5 days a week, 30 minutes a day. No additional therapy.
Number of participants	33
Duration of follow-up	4 weeks
Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear

Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	

Study arms

Mirror therapy with BF-FES: EMG + MT with FES (N = 22)

cochrane review combined both mirror therapy intervention groups and compared with control

usual care (N = 11)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 29)**
% Female Nominal	9
Mean age (SD) Mean (SD)	57.7 (NR)
Ethnicity Nominal	NR

Characteristic	Study (N = 29)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischemic Nominal	14
Time period since stroke days Mean (SD)	404.4 (NR)
side of paresis (left) Nominal	20

Outcomes

Study timepoints

- 4 week

4 week outcomes

Outcome	Mirror therapy with BF-FES: EMG + MT with FES, 4 week, N = 20	usual care, 4 week, N = 9
Motor function (Box and Block Test) Mean (SD)	13.6 (9.2)	12.56 (12.76)
Activities of daily living (FIM) Mean (SD)	29.6 (4.3)	25.56 (2.3)
Drop outs out of 22 and 11 Nominal	2	1
Stroke-Specific Quality of Life (SS-QOL) Mean (SD)	175.4 (28.26)	161.33 (30.85)

Motor function (Box and Block Test) - Polarity - Higher values are better

Activities of daily living (FIM) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Stroke-Specific Quality of Life (SS-QOL) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Motorfunction(BoxandBlockTest)-MeanSD-Mirror therapy with BF-FES: EMG + MT with FES-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with FES and BF-FES)*

4weekoutcomes-Dropouts-Nominal-Mirror therapy with BF-FES: EMG + MT with FES-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with FES and BF-FES)*

4weekoutcomes-Activitiesofdailyliving(FIM)-MeanSD-Mirror therapy with BF-FES: EMG + MT with FES-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with FES and BF-FES)*

4weekoutcomes-Stroke-SpecificQualityofLife(SS-QOL)-MeanSD-Mirror therapy with BF-FES: EMG + MT with FES-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with FES and BF-FES)*

Kim, 2016

Bibliographic Reference	Kim, Kyunghoon; Lee, Sukmin; Kim, Donghoon; Lee, Kyoungbo; Kim, Youlim; Effects of mirror therapy combined with motor tasks on upper extremity function and activities daily living of stroke patients; Journal of physical therapy science; 2016; vol. 28 (no. 2); 483-487

Study details

Secondary publication of another included study- see primary study for details	NR
Study location	Republic of Korea
Study setting	outpatient hospital
Study dates	NR
Sources of funding	NR
Inclusion criteria	hemiplegia due to stroke, stroke > 6 months. MMSE > 24, understanding the procedure and purpose of the study, volunteer participation in the study
Exclusion criteria	NR

Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: included reaching, grasping, manipulation, towel-folding, table-wiping, sponge-squeezing, peg-board, card-turnover, and typing with the unaffected limb while watching the mirror. 4 weeks, 5 days a week, 30 minutes a day.
Comparator	Conventional exercises: arm bicycling, peg-board exercise, skateboard-supported exercises on a table top, donut on base putty kneading, double curved arch, bimanual placing cone, block-stacking, graded pinch exercise, plastic-cone stacking, shoulder curved arch without mirror. 4 weeks, 5 days a week, 30 minutes a day of the control intervention.
Number of participants	25
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 12)

conventional exercise (N = 13)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 25)**
% Female Nominal	9
Mean age (SD) Mean (SD)	49.1 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Characteristic	Study (N = 25)
Type of stroke Ischaemic Nominal	8
Time period since stroke Nominal	NR
side of paresis (left) Nominal	16

Outcomes

Study timepoints

- Baseline
- 4 week

post intervention 4 week outcomes

Outcome	mirror therapy, Baseline, N = 12	mirror therapy, 4 week, N = 12	conventional exercise, Baseline, N = 13	conventional exercise, 4 week, N = 13
motor function (Action Reach Arm Test) 0-57 Mean (SD)	30.5 (3.8)	36.2 (3.4)	30.6 (3.2)	33.4 (3.1)

Outcome	mirror therapy, Baseline, N = 12	mirror therapy, 4 week, N = 12	conventional exercise, Baseline, N = 13	conventional exercise, 4 week, N = 13
motor impairment (Fugl-Meyer Assessment) 0-66 Mean (SD)	31 (3.5)	36.9 (3.3)	30.2 (2.4)	33.6 (3.2)
Fugl-Meyer Assessment 0-66 Mean (SD)	31 (3.5)	36.9 (3.3)	30.2 (2.4)	33.6 (3.2)
ADLS (Functional Independence Measure) Mean (SD)	70.5 (5.9)	77.3 (6.3)	68.9 (4.6)	72.6 (4.3)

motor function (Action Reach Arm Test) - Polarity - Higher values are better

motor impairment (Fugl-Meyer Assessment) - Polarity - Higher values are better

Fugl-Meyer Assessment - Polarity - Higher values are better

ADLS (Functional Independence Measure) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postintervention4weekoutcomes-ADLS(FunctionalIndependenceMeasure)-MeanSD-mirror therapy-conventional exercise-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postintervention4weekoutcomes-FuglMeyerAssessment-MeanSD-mirror therapy-conventional exercise-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postintervention4weekoutcomes-motorimpairment(FuglMeyerAssessment)-MeanSD-mirror therapy-conventional exercise-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postintervention4weekoutcomes-motorfunction(ActionReachArmTest)-MeanSD-mirror therapy-conventional exercise-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2018

Bibliographic Reference	Kim, M. K.; Choe, Y. W.; Shin, Y. J.; Peng, C.; Choi, E. H.; Effect of mirror use on lower extremity muscle strength of patients with chronic stroke; Journal of Physical Therapy Science; 2018; vol. 30 (no. 2); 213-215

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	No additional information.
Study dates	No additional information.

Sources of funding	This study was supported by a Daegu University Research Grant (2017).
Inclusion criteria	People with chronic stroke.
Exclusion criteria	No additional information.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=20 Two groups. Mirror therapy with lower extremity exercise, and mirror therapy with lower extremity muscle strength exercise group (same exercises with a sandbag on the ankle). 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital.
Comparator	Usual care N=10 Exercise only. 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital.
Number of participants	30.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 20)

Two groups. Mirror therapy with lower extremity exercise, and mirror therapy with lower extremity muscle strength exercise group (same exercises with a sandbag on the ankle). 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital.

Usual care (N = 10)

Exercise only. 5 sets 30 times a day, 5 times weekly for 4 weeks with general physical therapy in the hospital.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
% Female Nominal	17

Arm-level characteristics

Characteristic	Mirror therapy (N = 20)	Usual care (N = 10)
Mean age (SD) Mean (SD)	70.9 (11.9)	62.1 (9.5)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke Nominal	NR	NR
Left Nominal	13	4
Right Nominal	7	6

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
Motor impairment (quadriceps strength) Final values Mean (SD)	35.7 (9.2)	44.5 (9.8)	37.3 (7.5)	41.6 (8.8)

Motor impairment (quadriceps strength) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(quadricepsstrength)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kim, 2016

Bibliographic Reference	Kim, Mk; Ji, Sg; Cha, Hg; The effect of mirror therapy on balance ability of subacute stroke patients; Hong Kong Physiotherapy Journal; 2016; vol. 34; 27-32.

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	
Study location	Republic of Korea
Study setting	stroke rehabilitation unit
Study dates	NR
Sources of funding	No financial or material support of any kind was received for the work described in this article
Inclusion criteria	Sufficient cognitive ability to follow instructions (Mini-Mental State Examination score); only mild spasticity in all joints of the affected limb (Modified Ashworth Scale score<3); and a higher than fair score on the Manual Muscle test
Exclusion criteria	muscular-skeletal disorder and operation of the lower extremities; limited range of motion of the lower extremity; unilateral neglect, hemianopsia, or apraxia; and psychological or emotional problems

Recruitment / selection of participants	Patients with stroke were screened for this study from March 2014 to August 2014
Intervention(s)	mirror therapy and conventional rehabilitation therapy for a total of 60 minutes (mirror therapy: 30 minutes; conventional rehabilitation therapy: 30 minutes) per day, with a 10 minutes rest period halfway through the session. Participants in the experimental group received training 5 days/week for 4 weeks. for the mirror therapy the reflective surface was kept facing the non-paretic leg. The exercises performed in a semi seated position were: (1) hip-knee-ankle flexion; (2) knee extension with ankle dorsiflexion; and (3) knee flexion beyond 90 degrees. Balance exercises in front of the mirror were also performed. Conventional rehabilitation therapy consists of neurodevelopmental facilitation techniques.
Comparator	Subjects in the control group received sham therapy and conventional rehabilitation therapy for a total of 60 minutes (sham therapy: 30 minutes, conventional rehabilitation therapy: 30 minutes) per day on the same day. The control group performed the same exercise for the same duration as the experimental group, but the reflective side of the mirror was covered with white fabric. The control group performed the identical training in a space without a mirror training 5 days/week for 4 weeks. Conventional rehabilitation therapy consists of neurodevelopmental facilitation techniques.
Number of participants	34
Duration of follow-up	4 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	

Study arms

mirror therapy (N = 17)

sham mirror therapy (N = 17)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 34)**
% Female Nominal	19
Mean age (SD)	53.5 (8.9)

Characteristic	Study (N = 34)
Mean (SD)	
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischaemic Nominal	26

Arm-level characteristics

Characteristic	mirror therapy (N = 17)	sham mirror therapy (N = 17)
Time period since stroke Mean (SD)	4.7 (1.3)	4.5 (1.1)
side of paresis (left) Nominal	8	10

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	mirror therapy, Baseline, N = 17	mirror therapy, 4 week, N = 17	sham mirror therapy, Baseline, N = 17	sham mirror therapy, 4 week, N = 16
motor function (Balance Index- overall) (degree) measures degree of movement Mean (SD)	5.29 (0.79)	4.32 (1.12)	5.31 (0.87)	5.08 (0.88)
Dropouts Nominal	0	*empty data*	1	*empty data*

motor function (Balance Index- overall) - Polarity - Lower values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-Dropouts-Nominal-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Kojima, 2014

Bibliographic Reference	Kojima, Kosuke; Ikuno, Koki; Morii, Yuta; Tokuhisa, Kentaro; Morimoto, Shigeru; Shomoto, Koji; Feasibility study of a combined treatment of electromyography-triggered neuromuscular stimulation and mirror therapy in stroke patients: a randomized crossover trial; NeuroRehabilitation; 2014; vol. 34 (no. 2); 235-244

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Japan.
Study setting	Inpatient rehabilitation centre.
Study dates	November 2009 to May 2012.

Sources of funding	Not stated.
Inclusion criteria	Hemiparesis caused by a single stroke, between 30 and 180 days post-stroke, MMSE > 20, palpable contraction of paretic wrist and finger extensors, detectable EMG signal (> 5 V) from those muscles
Exclusion criteria	Cardiac pacemaker; serious contractures or pain in the shoulder, elbow or wrist; shoulder subluxation; severe cognitive impairment or severe aphasia; inability to give informed consent; engagement in any other experimental studies.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=6 Immediate Electromyography-triggered neuromuscular stimulation-Mirror therapy (ETMS-MT): electrical stimulation of extensor carpi radialis and extensor digitorum communis of the target threshold at the EMG level, which corresponded to 50% to 75% of the maximum active range of motion of wrist extension, if target threshold was exceeded electrical stimulation (10 seconds of symmetrical biphasic pulses at 50 Hz, pulse width of 200s, followed by 20 seconds of rest) triggered full range of motion. Mirror therapy: bimanual wrist and finger extension during 10 seconds of 'on' period, during 'oL' period bimanual exercises under mirror therapy condition without electrical stimulation, task difficulty was modulated gradually with functional level. 4 weeks, 5 days a week, two 20-minute sessions a day (additional therapy for the 1st 4 weeks, then crosses over. Only the first period will be considered in the analysis). Concomitant therapy: Standard physiotherapy and occupational therapy for 8 weeks, 5 days a week, 2 hours a day physiotherapy and occupational therapy.
Comparator	Usual care N=7 Delayed mirror therapy treatment (starts at 4 weeks. However, only the first phase is analysed for this review). Concomitant therapy: Standard physiotherapy and occupational therapy for 8 weeks, 5 days a week, 2 hours a day physiotherapy and occupational therapy.

Number of participants	13.
Duration of follow-up	4 weeks (8 weeks in total, but only the first phase of the trial will be included in the analysis).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 6)

Immediate Electromyography-triggered neuromuscular stimulation-Mirror therapy (ETMS-MT): electrical stimulation of extensor carpi radialis and extensor digitorum communis of the target threshold at the EMG level, which corresponded to 50% to 75% of the

maximum active range of motion of wrist extension, if target threshold was exceeded electrical stimulation (10 seconds of symmetrical biphasic pulses at 50 Hz, pulse width of 200s, followed by 20 seconds of rest) triggered full range of motion. Mirror therapy: bimanual wrist and finger extension during 10 seconds of 'on' period, during 'oL' period bimanual exercises under mirror therapy condition without electrical stimulation, task difficulty was modulated gradually with functional level. 4 weeks, 5 days a week, two 20-minute sessions a day (additional therapy for the 1st 4 weeks, then crosses over. Only the first period will be considered in the analysis). Concomitant therapy: Standard physiotherapy and occupational therapy for 8 weeks, 5 days a week, 2 hours a day physiotherapy and occupational therapy.

Usual care (N = 7)

Delayed mirror therapy treatment (starts at 4 weeks. However, only the first phase is analysed for this review). Concomitant therapy: Standard physiotherapy and occupational therapy for 8 weeks, 5 days a week, 2 hours a day physiotherapy and occupational therapy.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 6)	Usual care (N = 7)
% Female Nominal	1	2
Mean age (SD) (years) Mean (SD)	70.7 (10.3)	67.7 (15.5)
Ethnicity Nominal	NR	NR
Comorbidities	NR	NR

Characteristic	Mirror therapy (N = 6)	Usual care (N = 7)
Nominal		
Severity Nominal	NR	NR
Ischaemic Nominal	5	5
Haemorrhagic Nominal	1	2
Time period since stroke (days) Mean (SD)	88.3 (30.4)	70.7 (42.2)
Right Nominal	3	5
Left Nominal	3	2

Outcomes

Study timepoints

- Baseline
- 4 week

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 6	Mirror therapy, 4 week, N = 6	Usual care, Baseline, N = 7	Usual care, 4 week, N = 7
Upper limb motor function (Wolf Motor Function Test - Functional Ability Scale) Scale range: 0-75. Final value. Mean (SD)	39 (9.1)	45.2 (13)	35.4 (16.7)	40.1 (19.3)
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final values. Mean (SD)	37.7 (11.3)	46.2 (10.7)	33 (15.4)	35.6 (16.3)
Activities of daily living (Motor activity log amount of use) Scale range: 0-5. Final values. Mean (SD)	0.41 (0.47)	1.14 (0.97)	0.17 (0.25)	0.65 (1.06)

Upper limb motor function (Wolf Motor Function Test - Functional Ability Scale) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Activities of daily living (Motor activity log amount of use) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N =	Mirror therapy, 4 week, N =	Usual care, Baseline, N = 7	Usual care, 4 week, N = 7
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Cross-over trial

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(WolfMotorFunctionTest-FunctionalAbilityScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kumar, 2013

Bibliographic Reference	Kumar PV; Effect of functional electrical stimulation with mirror therapy on upper extremity motor function in poststroke patient: PhD Thesis; 2013; (no. Karnataka, Bangalore, India)

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	Not stated.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	1st stroke (ischaemic or haemorrhagic), unilateral stroke with hemiparesis, Brunnstrom recovery stage 2 - 4, age > 25 years, ambulatory before stroke, able to understand simple verbal instructions.
Exclusion criteria	Severe cognitive disorder, previous stroke, orthopaedic or rheumatologic problems restricting lower limbs, other diseases that interfere with ability to sit or moving lower limbs

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Mirror therapy for the lower extremity, self-selected speed, under supervision twice daily for 15 minutes for 10 days. Concomitant therapy: Conventional physical therapy 40 - 45 minutes/day for 10 days conventional physical therapy.
Comparator	Usual care N=15 No additional information. Concomitant therapy: Conventional physical therapy 40 - 45 minutes/day for 10 days conventional physical therapy.
Duration of follow-up	10 days (end of intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Mirror therapy for the lower extremity, self-selected speed, under supervision twice daily for 15 minutes for 10 days. Concomitant therapy: Conventional physical therapy 40 - 45 minutes/day for 10 days conventional physical therapy.

Usual care (N = 15)

No additional information. Concomitant therapy: Conventional physical therapy 40 - 45 minutes/day for 10 days conventional physical therapy.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
% Female Nominal	8

Characteristic	Study (N = 30)
Mean age (SD) Mean (SD)	57.3 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Outcomes

Study timepoints

- Baseline
- 10 day

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 10 day, N = 15	Usual care, Baseline, N = 15	Usual care, 10 day, N = 15
Motor impairment (lower limb - Fugl-Meyer Assessment Lower Extremity) Scale range: 0-34. Final value. Mean (SD)	NR (NR)	16.7 (3.2)	NR (NR)	15.1 (3)

Motor impairment (lower limb - Fugl-Meyer Assessment Lower Extremity) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 10 day, N = 15	Usual care, Baseline, N = 15	Usual care, 10 day, N = 15
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Motorimpairment(lowerlimb-Fugl-MeyerAssessmentLowerExtremity)-MeanSD-Mirror therapy-Usual care-t10

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t10

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Kuzgun, 2012

Bibliographic Reference	Kuzgun, S; Ozgen, M; Armagan, O; Tascloglu, F; Baydemir, C; The efficacy of mirror therapy combined with conventional stroke rehabilitation program on motor and functional recovery; Türk Beyin Damar Hastalıkları Dergisi [Turkish Journal of Cardiovascular Diseases]; 2012; vol. 18 (no. 3); 77-82

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR

Study location	Turkey
Study setting	NR
Study dates	NR
Sources of funding	NR
Inclusion criteria	1st stroke < 8 weeks; Brunnstrom recovery stages1 - 4
Exclusion criteria	previously received treatment/rehabilitation; MAS > 3; pain in the paretic side; cognitive impairments; vision impairments/neglect
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy involving wrist extension of non-paretic upper extremity for 15 mins, 4 times daily along with conventional rehab programme for 4 weeks, 5 days a week, daily 1 - 2 hours.
Comparator	Conventional rehabilitation programme for 4 weeks, 5 days a week, daily 1 - 2 hours with no additional therapy.
Number of participants	20
Duration of follow-up	4 weeks
Additional comments	Information based on an abstract; partly translated; not possible to contact author
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 10)

usual care (N = 10)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 20)**
% Female Nominal	10
Mean age (SD) Mean (SD)	61.4 (NR)
Ethnicity Nominal	NR

Characteristic	Study (N = 20)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR
side of paresis (left) Nominal	10

Outcomes

Study timepoints

- 4 week

4 week outcomes

Outcome	mirror therapy, 4 week, N = 10	usual care, 4 week, N = 10
motor impairment (FM-UE) 0-66	30.8 (21.7)	23.2 (15.7)

Outcome	mirror therapy, 4 week, N = 10	usual care, 4 week, N = 10
Mean (SD)		
Fugl Meyer Assessment Upper Extremity 0-66 Mean (SD)	30.8 (21.7)	23.2 (15.7)
Activities of daily living (barthel index) (0-20) Mean (SD)	72.6 (26.8)	63.9 (26)

motor impairment (FM-UE) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

Activities of daily living (barthel index) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcomes-motorimpairment(FM-UE)-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(information taken from abstract only and information from cochrane review)*
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(information taken from abstract only and information from cochrane review)*
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(information taken from abstract only and information from cochrane review)*
Overall bias and Directness	Overall Directness	Directly applicable

Lee, 2019

Bibliographic Reference	Lee, D.; Lee, G.; Effect of afferent electrical stimulation with mirror therapy on motor function, balance, and gait in chronic stroke survivors: a randomized controlled trial; European journal of physical & rehabilitation medicine.; 2019; vol. 55 (no. 4); 442-449

Study details

Secondary publication of another included study- see primary study for details	No additional information.

Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study location	South Korea.
Study setting	People admitted to a rehabilitation hospital.
Study dates	No additional information.
Sources of funding	No financial organisation gave funding for the material discussed in the manuscript.
Inclusion criteria	Those who were diagnosed with cerebral haemorrhage and cerebral infarction based on computed tomography or magnetic resonance imaging; those with disease duration of 6 months or more from stroke occurrence; those who scored 24 or higher on the Mini Mental State Examination; with no cognitive disorder that interfered with the purpose of the study; those capable of independent walking with or without assistance for 10 meters or more; who could passively conduct 10 degrees or greater ankle joint dorsiflexion.
Exclusion criteria	Those with a congenital deformity and orthopaedic disorder of the lower limbs; those with visual and perception disorders such as unilateral neglect or hemianopsia; those with apraxia; those with a pacemaker.
Recruitment / selection of participants	People were recruited by posting advertisements in the hospital, and the volunteers were screened according to the inclusion criteria.
Intervention(s)	Mirror therapy N=15 Mirror therapy with afferent electrical stimulation for 60 minutes per day, 5 days per week, for 4 weeks. Mirror therapy used a 50x70 cm mirror box that was placed infront of the person so that the person's hemiplegic lower limb was inside the box, while the non-hemiparetic side lower limb was in front of the box. The height of the chair was adjusted so that the angles of the knee and hip joints were 90 degrees and the mirror box was positioned so that the subject could see the mirror without leaning the upper limbs towards the non-hemiparetic side. For the afferent electrical stimulation, a sock-shaped electric stimulator was placed on the subject's hemiplegic leg, and electrical stimulation began just before the start of the experiment. The subject was instructed to dorsiflex the ankle joints on the hemiplegic side and on the non-hemiparetic side at the same time while looking at the movement of the non-hemiparetic side reflected in the mirror. As the person

	repeatedly tried to synchronize the dorsiflexion on both ankle joints while looking at the mirror, the afferent electrical stimulation device was activated continuously to provide electrical stimulation to the hemiplegic side (this used a Mesh Sock programmed with specific frequency, rest time and energization time. The P1 program was used comprising of 15 minutes of electric stimulation frequency at 100 Hz and pulse width of 300 microseconds, and 15 minutes of electric stimulation frequency at 15Hz and pulse width at 300 microseconds. The strength was adjusted to within a range that the person could sense).
Comparator	Sham therapy N=15 Sham mirror therapy and sham electrical stimulation (mirror box without a reflective mirror and the electrical device was set not to operate).
Number of participants	30.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Mirror therapy with afferent electrical stimulation for 60 minutes per day, 5 days per week, for 4 weeks. Mirror therapy used a 50x70 cm mirror box that was placed infront of the person so that the person's hemiplegic lower limb was inside the box, while the non-hemiparetic side lower limb was in front of the box. The height of the chair was adjusted so that the angles of the knee and hip joints were 90 degrees and the mirror box was positioned so that the subject could see the mirror without leaning the upper limbs towards the non-hemiparetic side. For the afferent electrical stimulation, a sock-shaped electric stimulator was placed on the subject's hemiplegic leg, and electrical stimulation began just before the start of the experiment. The subject was instructed to dorsiflex the ankle joints on the hemiplegic side and on the non-hemiparetic side at the same time while looking at the movement of the non-hemiparetic side reflected in the mirror. As the person repeatedly tried to synchronize the dorsiflexion on both ankle joints while looking at the mirror, the afferent electrical stimulation device was activated continuously to provide electrical stimulation to the hemiplegic side (this used a Mesh Sock programmed with specific frequency, rest time and energization time. The P1 program was used comprising of 15 minutes of electric stimulation frequency at 100 Hz and pulse width of 300 microseconds, and 15 minutes of electric stimulation frequency at 15Hz and pulse width at 300 microseconds. The strength was adjusted to within a range that the person could sense).

Sham therapy (N = 15)

Sham mirror therapy and sham electrical stimulation (mirror box without a reflective mirror and the electrical device was set not to operate).

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 15)	Sham therapy (N = 15)
% Female Nominal	4	5
Mean age (SD) Mean (SD)	50.8 (9)	50.13 (6.53)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	5	5
Haemorrhage Nominal	10	10
Time period since stroke (Months) Mean (SD)	41.33 (30.61)	44.87 (31.32)

Characteristic	Mirror therapy (N = 15)	Sham therapy (N = 15)
Left Nominal	5	8
Right Nominal	10	7

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N =	Sham therapy, Baseline, N = 15	Sham therapy, 4 week, N = 15
Lower limb motor function (Berg Balance Scale Score) Scale range: 0-56. Final value. Mean (SD)	46 (6.01)	48.13 (5.17)	38.6 (9.64)	40.27 (9.48)
Motor impairment (muscle strength) (lb) Final value. Mean (SD)	4.17 (1.98)	7.13 (2.8)	3.41 (2.66)	4.51 (3.89)

Lower limb motor function (Berg Balance Scale Score) - Polarity - Higher values are better

Motor impairment (muscle strength) - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Sham therapy, Baseline, N = 15	Sham therapy, 4 week, N = 15
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Lowerlimbmotorfunction(BergBalanceScaleScore)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Downgraded for comparison indirectness (compared electrical therapy and mirror therapy to sham therapy of both))*

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Motorimpairment(musclestrength)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Downgraded for comparison indirectness (compared electrical therapy and mirror therapy to sham therapy of both))*

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Downgraded for comparison indirectness (compared electrical therapy and mirror therapy to sham therapy of both))*

Lee, 2016

Bibliographic Reference	Lee, DongGeon; Lee, GyuChang; Jeong, JiSim; Mirror therapy with neuromuscular electrical stimulation for improving motor function of stroke survivors: a pilot randomized clinical study; Technology and health care; 2016; vol. 24 (no. 4); 503-511

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	rehabilitation hospital
Study dates	NR
Sources of funding	NR
Inclusion criteria	stroke diagnosed by a neurologist using computed tomography or magnetic resonance imaging, hemiplegia for > 6 months after stroke onset, active ankle dorsiflexion ROM > 10 °, ability to walk > 10 metres independently, MMSE > 21, no visual problems, no adverse effects from NMES,absence of use of any medication that could affect balance or gait
Exclusion criteria	Uncontrolled blood pressure or angina, history of seizure, pacemaker use, musculoskeletal problems of the lower extremity, any intervention other than conventional therapy
Recruitment / selection of participants	NR
Intervention(s)	MT + NMES: NMES electrodes placed on common peroneal nerve to stimulate eversion and dorsiflex-ion of the affected ankle, an external switch placed on forefoot of less affected side, if switch was released electrical stimulation started,

	participants dorsiflexed both ankles independently while observing the mirror. plus conventional physiotherapy for 4 weeks, 5 days a week, 1 hour a day. Additional 4 weeks, 5 days a week of the mirror therapy.
Comparator	Conventional physiotherapy 4 weeks, 5 days a week, 1 hour a day.
Number of participants	30
Duration of follow-up	1 day after intervention 4 weeks or 8 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

mirror therapy + NMES (N = 15)

conventional physiotherapy (N = 15)

Characteristics

Arm-level characteristics

Characteristic	mirror therapy + NMES (N = 15)	conventional physiotherapy (N = 15)
% Female Sample size	n = 7 ; % = 50	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	55.71 (6.7)	53.62 (6.29)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR

Characteristic	mirror therapy + NMES (N = 15)	conventional physiotherapy (N = 15)
Type of stroke ischaemic Nominal	4	4
Time period since stroke (Months) Mean (SD)	36.79 (26.07)	42.54 (33.9)
side of paresis (left) Nominal	6	2

Outcomes

Study timepoints

- Baseline
- 4 week

1 day post intervention outcomes

Outcome	mirror therapy + NMES, Baseline, N = 15	mirror therapy + NMES, 4 week, N = 14	conventional physiotherapy, Baseline, N = 15	conventional physiotherapy, 4 week, N = 13
motor function (berg balance scale) 0-56 Mean (SD)	40.3 (6.8)	46.3 (4.2)	39.3 (10.1)	37.6 (13.9)

Outcome	mirror therapy + NMES, Baseline, N = 15	mirror therapy + NMES, 4 week, N = 14	conventional physiotherapy, Baseline, N = 15	conventional physiotherapy, 4 week, N = 13
motor impairment (muscle strength lb) Mean (SD)	3.51 (1.86)	6.6 (3.1)	3.68 (2.7)	4.1 (3)
Dropouts Nominal	0	1	0	2

motor function (berg balance scale) - Polarity - Higher values are better

motor impairment (muscle strength lb) - Polarity - Higher values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

1daypostinterventionoutcomes-motorfunction(bergbalancescale)-MeanSD-mirror therapy + NMES-conventional physiotherapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

1daypostinterventionoutcomes-motorimpairment(musclestrengthlb)-MeanSD-mirror therapy + NMES-conventional physiotherapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

1daypostinterventionoutcomes-Dropouts-Nominal-mirror therapy + NMES-conventional physiotherapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Lee, 2012

Bibliographic Reference	Lee, Myung Mo; Cho, Hwi-young; Song, Chang Ho; The mirror therapy program enhances upper-limb motor recovery and motor function in acute stroke patients; American journal of physical medicine & rehabilitation; 2012; vol. 91 (no. 8); 689-700

Study details

Secondary publication of another included study- see primary study for details	NR

Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Republic of Korea
Study setting	Inpatient rehabilitation centre
Study dates	NR
Sources of funding	NR
Inclusion criteria	stroke within last 6 months, able to understand and follow the instructions (MMSE >21), Brunnstrom recovery stages upper limb 1 - 4
Exclusion criteria	orthopaedic disorders, apraxia, hemineglect, upper-limb fracture, peripheral nerveinjury, participation in other studies or rehabilitation programmes, participation rate < 80%
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: participants were instructed to observe their unaffected upper limb in mirror box while performing movements of the unaffected limb, performed by participants themselves under supervision of a guardian for 1st 4 weeks, 5 days/week, 25 minutes twice a day. Plus 75 minutes, 5 times/week usual rehabilitation programme.
Comparator	Usual rehabilitation programme 75 minutes, 5 times/week. No additional therapy.
Number of participants	28
Duration of follow-up	1 day after intervention (approx 4 weeks)
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 14)

usual care (N = 14)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 26)**
% Female Nominal	11

Characteristic	Study (N = 26)
Mean age (SD) Mean (SD)	57.1 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke months Mean (SD)	3.6 (NR)
side of paresis (left) Nominal	11

Outcomes

Study timepoints

- 4 week (only states 1 day post intervention but MT intervention was 4 weeks so assuming this is time point)

post intervention outcomes

Outcome	mirror therapy, 4 week, N = 13	usual care, 4 week, N = 13
motor function (manual function UL)test 0-32 Mean (SD)	11.4 (2.7)	9.3 (4)
motor impairment (FM-UE) 0-66 Mean (SD)	36.3 (6.34)	27.9 (7.77)
Fugl Meyer Assessment Upper Extremity 0-66 Mean (SD)	36.3 (6.34)	27.9 (7.77)
Dropout Nominal	1	1

motor function (manual function UL)test - Polarity - Higher values are better

motor impairment (FM-UE) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

Dropout - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postinterventionoutcomes-motorfunction(manualfunctionUL)test-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-motorimpairment(FM-UE)-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-Dropout-Nominal-mirror therapy-usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Lee, 2019

Bibliographic Reference	Lee, Si A.; Cha, Hyun Gyu; The effect of motor imagery and mirror therapy on upper extremity function according to the level of cognition in stroke patients; International Journal of Rehabilitation Research; 2019; vol. 42 (no. 4); 330-336

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	A neurological physical therapy inpatient clinic.
Study dates	No additional information.

Sources of funding	No additional information.
Inclusion criteria	Less than 6 months after stroke diagnosis; mild to moderate motor impairment (total Fugl-Meyer assessment upper extremity scores of 26-56); mild spasticity of the affected upper extremity (Modified Ashworth Scale score <3).
Exclusion criteria	Orthopaedic injuries of the musculoskeletal system; severe visual impairment or visual perception impairments.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=12 Mirror therapy. The mirror was placed vertically on the table in front of the subject. Based on the mirror in the middle of the subject, both upper extremities were placed on the table. The non-paretic side upper extremity was placed on the side of the mirror and the upper extremity of the paretic side was placed on the back of the mirror. The subject was prevented from seeing the upper extremity of the paretic side and was instructed to see the movement of the upper extremity of the non-paretic side projected through the mirror. Although the upper extremity of the non-paretic side was moving, the subject was asked to try the same movements as the upper extremity of the paretic side is reflected in the mirror. Completed for 4 weeks.
Comparator	Usual care N=12 Motor imagery. People listened to mp3 files lasting 30 minutes. The contents of the mp3 file was modified from the study of Page and Peters (2014). Motor imagery training was conducted with eyes closed to prevent visual interference effects. The contents of the file included: the subject being asked to relax the muscles for 5 minutes, while imagining themselves in a comfortable place; 2) for 20 minutes to imagine the action of bringing the cup on the table in close to the body, then to imagine the drink was half full in a plastic cup and to drink from the cup; 3) finally, to relax their mind and rest for 5 minutes. Completed for 4 weeks.
Number of participants	24.
Duration of follow-up	4 weeks.
Additional comments	No additional information.

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 12)

Mirror therapy. The mirror was placed vertically on the table in front of the subject. Based on the mirror in the middle of the subject, both upper extremities were placed on the table. The non-paretic side upper extremity was placed on the side of the mirror and the upper extremity of the paretic side was placed on the back of the mirror. The subject was prevented from seeing the upper extremity of the paretic side and was instructed to see the movement of the upper extremity of the non-paretic side projected through the mirror. Although the upper extremity of the non-paretic side was moving, the subject was asked to try the same movements as the upper extremity of the paretic side is reflected in the mirror. Completed for 4 weeks.

Usual care (N = 12)

Motor imagery. People listened to mp3 files lasting 30 minutes. The contents of the mp3 file was modified from the study of Page and Peters (2014). Motor imagery training was conducted with eyes closed to prevent visual interference effects. The contents of the file included: the subject being asked to relax the muscles for 5 minutes, while imagining themselves in a comfortable place; 2) for 20 minutes to imagine the action of bringing the cup on the table in close to the body, then to imagine the drink was half full in a plastic cup and to drink from the cup; 3) finally, to relax their mind and rest for 5 minutes. Completed for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 12)	Usual care (N = 12)
% Female Nominal	5	4
Mean age (SD) Mean (SD)	72.3 (5)	71.8 (3.9)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction	7	8

Characteristic	Mirror therapy (N = 12)	Usual care (N = 12)
Nominal		
Haemorrhage Nominal	5	4
Time period since stroke (month) Mean (SD)	4.2 (0.75)	3.3 (0.81)
Right Nominal	9	8
Left Nominal	3	4

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 4 week, N = 12	Usual care, Baseline, N = 12	Usual care, 4 week, N = 12
Upper limb motor function (Manual Function Test) Scale range: 0-32. Final value. Mean (SD)	22.67 (2.99)	29.17 (3.89)	22.59 (3.14)	24.84 (5.38)

Upper limb motor function (Manual Function Test) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Upperlimbmotorfunction(ManualFunctionTest)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Li, 2019

Bibliographic Reference	Li, Y. C.; Wu, C. Y.; Hsieh, Y. W.; Lin, K. C.; Yao, G.; Chen, C. L.; Lee, Y. Y.; The Priming Effects of Mirror Visual Feedback on Bilateral Task Practice: A Randomized Controlled Study; Occupational Therapy International; 2019; vol. 2019; 3180306

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Taiwan.
Study setting	People from 4 participating sites, including 1 medical center and 3 regional hospitals.
Study dates	No additional information.
Sources of funding	This study was partly supported by the National Health Research Institutes (NIHRI-EX106-10403PI, NHRI-EX107-10403PI, and NHRI-EX106-10604PI) and the Ministry of Science and Technology (103-2314-B-002-008-MY3, 103-2314-B-182-004-MY3, 104-2314-B-002-019-MY3, 105-2314-B-182-037-MY3, 105-2314-B-182-018, 107-2314-B-002-052, and 108-2314-B-002-165-MY3) of Taiwan.
Inclusion criteria	People who had sustained their first-ever unilateral ischaemic or haemorrhagic stroke more than 6 months after the onset; had mild to moderate motor impairment (total Fugl-Meyer Assessment upper extremity score between 18 and 55); was able to follow instructions
Exclusion criteria	Severe spasticity in any joint of the affected arm (modified Ashworth Scale score <3); serious vision deficits (based on the best gaze score on the National Institutes of Health Stroke Scale); other neurologic, neuromuscular or orthopaedic disorder; simultaneously participating in other studies; had received botulinum toxin injections within the past 3 months.
Recruitment / selection of participants	No additional information.

Intervention(s)	Mirror therapy N=12 Hospital-based mirror therapy 1.5 hours/day, 3 days/week for 4 weeks. Included mirror box training for 45 minutes and functional training for 45 minutes. After 10 minutes of warm-up exercises, including stretching and passive range of motion exercises, a portable mirror box (48x36x36cm^3) was placed in the midsagittal plane of each participant. The affected arm was positioned behind the other. The movements of the unaffected arm in front of the mirror was reflected as if the affected side was being moved. During the mirror box training, the participants were guided to gaze at the mirrored image to allow them to imagine that the reflection was their affected arm performing the activities and to move both arms in symmetric patterns as simultaneously as possible. The activities consisted of 10 minutes of non-task oriented movements, such as forearm pronation/supination or finger flexion/extension, and 35 minutes of task-oriented activities such as picking up the handset from the phone, picking up items and putting them in the box, or other functional tasks involved in daily activities. This was followed by functional training, such as chopping vegetables and pouring water from a kettle.
Comparator	Usual care N=11 Similar care, but no mirror box was used.
Number of participants	23.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 12)

Hospital-based mirror therapy 1.5 hours/day, 3 days/week for 4 weeks. Included mirror box training for 45 minutes and functional training for 45 minutes. After 10 minutes of warm-up exercises, including stretching and passive range of motion exercises, a portable mirror box (48x36x36cm^3) was placed in the midsagittal plane of each participant. The affected arm was positioned behind the other. The movements of the unaffected arm in front of the mirror was reflected as if the affected side was being moved. During the mirror box training, the participants were guided to gaze at the mirrored image to allow them to imagine that the reflection was their affected arm performing the activities and to move both arms in symmetric patterns as simultaneously as possible. The activities consisted of 10 minutes of non-task oriented movements, such as forearm pronation/supination or finger flexion/extension, and 35 minutes of task-oriented activities such as picking up the handset from the phone, picking up items and putting them in the box, or other functional tasks involved in daily activities. This was followed by functional training, such as chopping vegetables and pouring water from a kettle.

Usual care (N = 11)

Similar care, but no mirror box was used.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 12)	Usual care (N = 11)
% Female Nominal	5	5
Mean age (SD) Mean (SD)	50.72 (10.75)	58.77 (8.91)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity National Institutes of Health Stroke Scale. Mean (SD)	4.25 (2.53)	4.91 (3.51)
Ischaemic Nominal	6	6
Haemorrhagic Nominal	6	5
Time period since stroke (Months) Mean (SD)	57.92 (29.92)	47.64 (33.9)

Characteristic	Mirror therapy (N = 12)	Usual care (N = 11)
Left Nominal	5	5
Right Nominal	7	6

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 4 week, N = 12	Usual care, Baseline, N = 11	Usual care, 4 week, N = 11
Upper limb motor function (Chedoke Arm and Hand Activity Inventory) Scale range: 13-91. Final value. Mean (SD)	41.42 (7.05)	46.58 (9.39)	42.82 (11.63)	50.27 (14.93)
Fugl Meyer Asessment Upper Extremity Scale range: 0-66. Final value. Mean (SD)	33.42 (7.48)	36.17 (8.01)	33 (9.74)	36.27 (9.57)

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 4 week, N = 12	Usual care, Baseline, N = 11	Usual care, 4 week, N = 11
Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) Scale range: 0-100. Final value. Mean (SD)	65.46 (6.87)	71.38 (9.44)	64.46 (20.53)	64.56 (17.4)

Upper limb motor function (Chedoke Arm and Hand Activity Inventory) - Polarity - Higher values are better

Fugl Meyer Asessment Upper Extremity - Polarity - Higher values are better

Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 12	Mirror therapy, 4 week, N = 12	Usual care, Baseline, N = 11	Usual care, 4 week, N = 11
Dropouts Nominal	NA	1	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(ChedokeArmandHandActivityInventory)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAsessmentUpperExtremity-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Lim, 2016

Bibliographic Reference	Lim, Kil-Byung; Lee, Hong-Jae; Yoo, Jeehyun; Yun, Hyun-Ju; Hwang, Hye-Jung; Efficacy of mirror therapy containing functional tasks in poststroke patients; Annals of rehabilitation medicine; 2016; vol. 40 (no. 4); 629

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	inpatient rehabilitation centre
Study dates	February to May 2012
Sources of funding	NR
Inclusion criteria	hemiplegia due to stroke within 6 months, Korean version of MMSE > 24, BRS upperextremity of 3 to 4
Exclusion criteria	musculoskeletal disease, neglect, mental illness

Recruitment / selection of participants	NR
Intervention(s)	Mirror Therapy: bilateral task-oriented mirror therapy, during 1st week simple movements, such as forearm pronation-supination and wrist flexion/extension; in the 2nd week finger flexion-extension, counting numbers, tapping, and opposing; during 3rd week, simple manipulating tasks, such as picking up coins and beans, flipping over cards and collecting blocks in a bin; during 4th week, more complicated tasks of plugging and unplugging pegboards, drawing simple figures, and colouring. 4 weeks, 5 days a week, 20 minutes/day MT 2. Sham therapy: task-oriented bilateral arm training as stated, but with non-reflecting board betweenlimbs1 and 2: 4 weeks, 5 days a week, 20 minutes/day MT or sham therapy
Comparator	Sham mirror Therapy: bilateral task-oriented mirror therapy using a non-reflecting board between limbs. During the 1st week simple movements, such as forearm pronation-supination and wrist flexion/extension; in the 2nd week finger flexion-extension, counting numbers, tapping, and opposing; during 3rd week, simple manipulating tasks, such as picking up coins and beans, flipping over cards and collecting blocks in a bin; during 4th week, more complicated tasks of plugging and unplugging pegboards, drawing simple figures, and colouring. 4 weeks, 5 days a week, 20 minutes/day sham MT.
Number of participants	60
Duration of follow-up	post intervention (intervention was 4 weeks so assume FU was approx 4 weeks)
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	

Study arms

mirror therapy (N = 30)

sham mirror therapy (N = 30)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 60)**
% Female Nominal	21

Characteristic	Study (N = 60)
Mean age (SD) Mean (SD)	64.9 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischaemic Nominal	19
Time period since stroke (days) Nominal	52
side of paresis (left) Nominal	31

Outcomes

Study timepoints

- Baseline
- 4 week (study reports post intervention FU but intervention was 4 weeks so assuming this was the time point)

post intervention outcomes

Outcome	mirror therapy, Baseline, N = 30	mirror therapy, 4 week, N = 30	sham mirror therapy, Baseline, N = 30	sham mirror therapy, 4 week, N = 30
motor impairment (Fugl-Meyer Assessment) 0-66 Mean (SD)	26.93 (6.32)	41.4 (9.04)	26.9 (6.32)	37.4 (9.04)
Fugl-Meyer Assessment 0-66 Mean (SD)	26.93 (*empty data*)	41.4 (9.04)	26.9 (6.32)	37.4 (9.04)
Activities of daily living (Modified Barthel Index) 0-20 Mean (SD)	28.67 (7.57)	59.63 (15.58)	26.77 (6.6)	51.37 (16.34)
Drop outs Nominal	0	0	0	0

motor impairment (Fugl-Meyer Assessment) - Polarity - Higher values are better

Fugl-Meyer Assessment - Polarity - Higher values are better

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postinterventionoutcomes-Dropouts-Nominal-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-Fugl-MeyerAssessment-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-motorimpairment(Fugl-MeyerAssessment)-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postinterventionoutcomes-Activitiesofdailyliving(ModifiedBarthelIndex)-MeanSD-mirror therapy-sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Lin, 2014

Bibliographic Reference	Lin, Keh-Chung; Huang, Pai-Chuan; Chen, Yu-ting; Wu, Ching-yi; Huang, Wen-ling; Combining afferent stimulation and mirror therapy for rehabilitating motor function, motor control, ambulation, and daily functions after stroke; Neurorehabilitation and neural repair; 2014; vol. 28 (no. 2); 153-162

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Taiwan
Study setting	Inpatient and outpatient
Study dates	NR

Sources of funding	National Health Research Institutes, National Science Council, Healthy Ageing Re-search Center at Chang Gung University, Taiwan
Inclusion criteria	ischaemic or haemorrhagic stroke of at least 6 months duration, Brunnstrom stage 3or above in the arm
Exclusion criteria	severe spasticity in any joints of the affected arm (modified AS ≤ 2), serious cognitive deficits (MMSE score > 24), serious vision or visual perception deficits (score of 0 on the best gaze and visual subtest of the National Institutes of Health Stroke Scale), history of other neurologic, neuromuscular, or orthopaedic disease, participation in other studies concurrent with this study
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy alone: 10 minutes warm-up, 1 hour mirror-box training (bilateral movement (transitive and intransitive gross motor tasks)), 20 minutes functional task practice 4 weeks, 5 days a week, 1½ hours daily. Mirror therapy while using a mesh-glove for sensory stimulation 4 weeks, 5 days a week, 1½ hours daily.
Comparator	Task-oriented treatment 4 weeks, 5 days a week, 1½ hours daily
Number of participants	43
Duration of follow-up	post intervention (intervention was 4 weeks)
Additional comments	

Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy arm + Mirror therapy with mesh glove (N = 28)

study has 3 arms - mirror therapy, mirror therapy plus mesh glove and control group. results of MT and MT plus glove are pooled for intervention analysis

task orientated training (N = 15)

Characteristics

Study-level characteristics

Characteristic	Study (N = 43)
% Female Nominal	11
Mean age (SD) Mean (SD)	55 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	20
Time period since stroke (Months) Mean (SD)	19.6 (NR)
side of paresis (left) Nominal	22

Outcomes

Study timepoints

- Baseline
- 4 week (study reports post intervention but intervention is 4 weeks)

4 week outcome

Outcome	Mirror therapy arm + Mirror therapy with mesh glove, Baseline, N = 28	Mirror therapy arm + Mirror therapy with mesh glove, 4 week, N = 28	task orientated training, Baseline, N = 14	task orientated training, 4 week, N = 14
Motor function (Box and Block Test) Mean (SD)	*empty data*	17.1 (14.3)	*empty data*	19.9 (15.2)
motor impairment (fugel meyer assessment) 0-66 Mean (SD)	*empty data*	50.4 (9.1)	*empty data*	47.13 (10.12)
fugel meyer assessment 0-66 Mean (SD)	*empty data*	50.4 (9.1)	*empty data*	47.13 (10.12)
ADLs (motor activity log - amount of time used Mean (SD)	*empty data*	1.3 (2.6)	*empty data*	1.1 (1.3)
Drop outs No of events	n = 0	n = 0	n = 0	n = 1

Motor function (Box and Block Test) - Polarity - Higher values are better

motor impairment (fugel meyer assessment) - Polarity - Higher values are better

fugel meyer assessment - Polarity - Higher values are better

ADLs (motor activity log - amount of time used - Polarity - Higher values are better

Drop outs - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

4weekoutcome-ADLs(motoractivitylog-amountoftimeused-MeanSD-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

4weekoutcome-fugelmeyerassessment-MeanSD-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

4weekoutcome-Dropouts-NoOfEvents-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

4weekoutcome-Motorfunction(BoxandBlockTest)-MeanSD-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

4weekoutcome-motorimpairment(fugelmeyerassessment)-MeanSD-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

4weekoutcome-motorimpairment(fugelmeyerassessment)-MeanSE-Mirror therapy arm + Mirror therapy with mesh glove-task orientated training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(study combines mirror therapy plus mirror therapy with mesh glove and pools results for the intervention group)*

Liu, 2021

Bibliographic Reference	Liu, Meikuai; Xu, Leyi; Li, Haiyan; Chen, Shunping; Chen, Bin; Morphological and Functional Changes of the Tibialis Anterior Muscle After Combined Mirror Visual Feedback and Electromyographic Biofeedback in Poststroke Patients: A Randomized Trial.; American journal of physical medicine & rehabilitation; 2021; vol. 100 (no. 8); 766-773

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	(Registration No. ChiCTR1800017050
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	From the Departments of Ultrasonography (ML, SC, BC) and RehabilitationMedicine (LX, HL), the First Affiliated Hospital of Wenzhou Medical University, Wenzhou, China.
Study dates	NR
Sources of funding	This work was supported by the Wenzhou Science and Technology Project (No. Y20170217)
Inclusion criteria	(1) older than 18 yrs; (2) 15–90 days after the onset of stroke; (3) intact walking ability before stroke; (4) Brunnstrom staging of 3 or greater, with foot ptosis/varus and no active movement in the ankle joint; and (5) stable vital signs and mental status, and normal cognitive functions with a mini-mental state examination score of 24 or greater.
Exclusion criteria	(1) complications with other diseases affecting motor function, such as severe joint or muscle deformities; (2) complications with serious heart, liver, or kidney diseases or infection; (3) unilateral neglect or triquetral impingement ligament tear syndrome; (4) corrected visual acuity of less than 0.5; or (5) cognitive impairment (mini-mental state examination score <24).
Recruitment / selection of participants	Referred by neurologists to the department of rehabilitation medicine.

Intervention(s)	Mirror therapy N=31 Combination of two groups: 1) mirror therapy with visual feedback and electromyographic biofeedback (n=16), 2) mirror therapy with visual feedback (n=15). Mirror therapy was provided once daily, 5 days a week for 4 weeks in 30 minute sessions. A mirror (100 cm x 50 cm) was placed along the midsagittal plane and the unaffected leg was placed on the reflective side (while the affected leg was hidden). During treatment the person was instructed to focus on the mirror and complete the movements bilaterally completing ankle dorisflexion and attempt to reach the maximum range of motion for the joint. For the biofeedback group they received biofeedback through a bidirectional square wave a frequency of 60 Hz, at 20-50mA, for 10 secs of stimulation at an interval at 10 seconds. The therapy was provided once daily, 5 days a week for 4 weeks for 30 minutes each session in addition to the mirror therapy. Concomitant therapy: All patients received routine rehabilitation training, including occupational therapy and physical therapy. Conventional physical therapy included training of the lower limb muscle strength, training of the muscle facilitation, training of the trunk stability, and gait training. Occupational therapy refers to an upper limb training program for activities of daily living. This training lasted 4 hours a day, 5 days a week for 4 weeks.
Comparator	Usual care N=15 Usual care only. Concomitant therapy: All patients received routine rehabilitation training, including occupational therapy and physical therapy. Conventional physical therapy included training of the lower limb muscle strength, training of the muscle facilitation, training of the trunk stability, and gait training. Occupational therapy refers to an upper limb training program for activities of daily living. This training lasted 4 hours a day, 5 days a week for 4 weeks.
Number of participants	46
Duration of follow-up	4 weeks

Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	NR

Study arms

Mirror therapy (N = 31)

Combination of two groups: 1) mirror therapy with visual feedback and electromyographic biofeedback (n=16), 2) mirror therapy with visual feedback (n=15). Mirror therapy was provided once daily, 5 days a week for 4 weeks in 30 minute sessions. A mirror (100 cm x 50 cm) was placed along the midsagittal plane and the unaffected leg was placed on the reflective side (while the affected leg was hidden). During treatment the person was instructed to focus on the mirror and complete the movements bilaterally completing ankle dorisflexion and attempt to reach the maximum range of motion for the joint. For the biofeedback group they received biofeedback through a bidirectional square wave a frequency of 60 Hz, at 20-50mA, for 10 secs of stimulation at an interval at 10 seconds. The therapy was provided once daily, 5 days a week for 4 weeks for 30 minutes each session in addition to the mirror therapy.

Concomitant therapy: All patients received routine rehabilitation training, including occupational therapy and physical therapy. Conventional physical therapy included training of the lower limb muscle strength, training of the muscle facilitation, training of the trunk stability, and gait training. Occupational therapy refers to an upper limb training program for activities of daily living. This training lasted 4 hours a day, 5 days a week for 4 weeks.

Usual care (N = 15)

Usual care only. Concomitant therapy: All patients received routine rehabilitation training, including occupational therapy and physical therapy. Conventional physical therapy included training of the lower limb muscle strength, training of the muscle facilitation, training of the trunk stability, and gait training. Occupational therapy refers to an upper limb training program for activities of daily living. This training lasted 4 hours a day, 5 days a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 31)**	**Usual care (N = 15)**
% Female Sample size	n = 6 ; % = 40	n = 8 ; % = 53.3
Mean age (SD) (years) Mean (SD)	62.1 (9.87)	62.2 (7.43)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR

Characteristic	Mirror therapy (N = 31)	Usual care (N = 15)
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke (Weeks) Mean (SD)	44.74 (31.1)	44.27 (29.6)

Outcomes

Study timepoints

- Baseline
- 4 week

Continuous outcomes

Outcome	Mirror therapy , Baseline, N = 31	Mirror therapy , 4 week, N = 31	Usual care, Baseline, N = 15	Usual care, 4 week, N = 15
Lower limb motor function (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	25.64 (11.8)	38.42 (9.71)	32.6 (13.04)	36.87 (12.58)

Outcome	Mirror therapy , Baseline, N = 31	Mirror therapy , 4 week, N = 31	Usual care, Baseline, N = 15	Usual care, 4 week, N = 15
Measures of motor impairment - lower extremity (Fugl Meyer Assessment - Lower Extremity) Scale range: 0-34. Final values. Mean (SD)	16.58 (6.84)	24.16 (6.72)	19.47 (8.48)	22.8 (8.44)
Activities of daily living (Modified Barthel Index) Scale range: 0-100. Final values. Mean (SD)	54.57 (19.59)	72.32 (20.37)	57.73 (23.1)	72.33 (21.55)

Lower limb motor function (Berg Balance Scale) - Polarity - Higher values are better

Measures of motor impairment - lower extremity (Fugl Meyer Assessment - Lower Extremity) - Polarity - Higher values are better

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mirror therapy , Baseline, N = 31	Mirror therapy , 4 week, N = 31	Usual care, Baseline, N = 15	Usual care, 4 week, N = 15
Dropout rate No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Dropout rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Activitiesofdailyliving(MBI)finalvalues-MeanSD-Mirror therapy -Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Measuresofmotorimpairment-lowerextremity(FMA-LE)finalvalues-MeanSD-Mirror therapy -Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Lowerlimbmotorfunction(bergbalancescale)finalvalues-MeanSD-Mirror therapy -Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Dropoutrata-NoOfEvents-Mirror therapy -Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Madhoun, 2020

Bibliographic Reference	Madhoun, H. Y.; Tan, B.; Feng, Y.; Zhou, Y.; Zhou, C.; Yu, L.; Task-based mirror therapy enhances the upper limb motor function in subacute stroke patients: a randomized control trial; European journal of physical & rehabilitation medicine.; 2020; vol. 56 (no. 3); 265-271

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	The Rehabilitation Medicine and Physical Therapy Department at Second Affiliated Hospital of Chongqing Medical University.

Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	People diagnosed with the first stroke at age between 20 and 85; had a stroke in less than 6 months; had a Brunnstrom stage for upper limb functional from 1 to 3; showed a good cognitive condition (with a score 24 points or more of Montreal Cognitive Assessment); had a poor and limited upper limb function (Fugl Meyer Assessment for upper limb score below 47).
Exclusion criteria	Visual problem; aphasia; unilateral neglect; musculoskeletal disease; participating in antoher study.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=18 Task-based mirror therapy. The size of the mirror box was 35x40x20cm. The person sat near the mirror, which is diagonally located along the body level between the two limbs. The unaffected limb is positioned at the anterior side of the mirror while the affected limb was hidden all the time. As a result, the people can observe the healthy limb reflection on the mirror, creating a perception that the affected limb is moving. The activities performed by the patients included: elbow flexion, extension, ulnar and radial deviation, flexion and extension of the wrist, flexion and extension of the fingers, abduction, and adduction of all fingers. These activities were conducted using various objects such as spongy ball, a bottle of water, a duster, chopstick, a cup, cubes, wooden blocks and so forth. This group underwent 25 minutes of functional task with the mirror every day in addition to conventional therapy if needed, such as manual therapy and acupuncture. The sessions were done under the supervision of the occupational therapist in the occupational therapy room.
Comparator	Usual care N=17 Occupational therapy without a mirror for 25 minutes in addition to conventional therapy if the patients required. Similarly, the sessions were done under the supervision of the occupational therapist in the occupational therapy room.
Number of participants	35.
Duration of follow-up	25 days (end of intervention).

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 18)

Task-based mirror therapy. The size of the mirror box was 35x40x20cm. The person sat near the mirror, which is diagonally located along the body level between the two limbs. The unaffected limb is positioned at the anterior side of the mirror while the affected limb was hidden all the time. As a result, the people can observe the healthy limb reflection on the mirror, creating a perception that the affected limb is moving. The activities performed by the patients included: elbow flexion, extension, ulnar and radial deviation, flexion and extension of the wrist, flexion and extension of the fingers, abduction, and adduction of all fingers. These activities were conducted using various objects such as spongy ball, a bottle of water, a duster, chopstick, a cup, cubes, wooden blocks and so forth. This group underwent 25 minutes of functional task with the mirror every day in addition to conventional therapy if needed, such as

manual therapy and acupuncture. The sessions were done under the supervision of the occupational therapist in the occupational therapy room.

Usual care (N = 17)

Occupational therapy without a mirror for 25 minutes in addition to conventional therapy if the patients required. Similarly, the sessions were done under the supervision of the occupational therapist in the occupational therapy room.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
% Female Nominal	4	6
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	5	4

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
Haemorrhagic Nominal	10	11
Time period since stroke (Months) Mean (SD)	4.13 (1.84)	3.6 (1.76)
Left Nominal	9	10
Right Nominal	6	5

Outcomes

Study timepoints

- Baseline
- 25 day (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 25 day, N = 15	Usual care, Baseline, N = 17	Usual care, 25 day, N = 15
Upper limb motor function (Brunnstrom Upper Limb and Hand)	2.6 (0.5)	3.17 (0.65)	2.33 (0.82)	2.97 (0.9)

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 25 day, N = 15	Usual care, Baseline, N = 17	Usual care, 25 day, N = 15
The Upper limb and hand data was combined for the analysis. Scale range: 1-7. Final value. Mean (SD)				
Fugl Meyer Asessment Upper Extremiity Scale range: 0-66. Final value. Mean (SD)	19.33 (7.62)	31.4 (8.19)	20.6 (12.07)	27.07 (12.49)
Activities of daily living (Modified Barthel Index) Scale range: 0-100. Final value. Mean (SD)	54.53 (23.75)	72.27 (16.58)	57.4 (20.1)	70.13 (19.25)

Upper limb motor function (Brunnstrom Upper Limb and Hand) - Polarity - Higher values are better

Fugl Meyer Asessment Upper Extremiity - Polarity - Higher values are better

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 25 day, N = 18	Usual care, Baseline, N = 17	Usual care, 25 day, N = 17
Dropouts Nominal	NA	3	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BrunnstromUpperLimbandHand)-MeanSD-Mirror therapy-Usual care-t25

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAsessmentUpperExtremiity-MeanSD-Mirror therapy-Usual care-t25

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(ModifiedBarthelIndex)-MeanSD-Mirror therapy-Usual care-t25

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t25

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Manton, 2002

Bibliographic Reference	Manton, JC; Hanson, C; The effects of a new treatment for survivors of stroke six months or more post-cerebrovascular accident; Physical Therapy; 2002; vol. 82 (no. 5); Abstract PL-RR

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	USA
Study setting	Home

Study dates	NR
Sources of funding	NR
Inclusion criteria	6 months or more post-cerebrovascular accident
Exclusion criteria	NR
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: home exercise programme with a mirror exercise unit for 4 weeks
Comparator	Control group: same programme with a plexiglass exercise unit for 4 weeks
Number of participants	10
Duration of follow-up	mid-treatment, post-treatment and after 3 months
Additional comments	information taken from cochrane review only abstract available so no additional data to add. No results included in Cochrane
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Not stated/unclear
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear

Subgroup analysis - further details	no details on limb used

Study arms

mirror therapy (N = 5)

no details on number of participants in each arm but assuming half of total (10)

control sham mirror therapy (N = 5)

no details on number of participants in each arm but assuming half of total (10)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 10)**
% Female Nominal	NR
Mean age (SD) Mean (SD)	NR (NR)
Ethnicity Nominal	NR
Comorbidities	NR

Characteristic	Study (N = 10)
Nominal	
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR
side of paresis Left Nominal	NR

Manzoor, 2021

Bibliographic Reference	Manzoor, S.; Umar, B.; Niaz, M.; Afzal, A.; Naz, M.; Effectiveness of mirror therapy on upper limb function in patients with stroke (monoplegic); Pakistan Journal of Medical and Health Sciences; 2021; vol. 15 (no. 1); 183-185

Study details

Secondary publication of another included	No additional information.

study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Pakistan.
Study setting	The Khalid Rehabilitation Center of Faisalabad.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	People with monoplegia after a stroke. Inclusion and exclusion criteria not stated.
Exclusion criteria	Not stated.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=8 Mirror therapy with parasagital mirror frequency of 30 minute/daily, 5 days/week and four weeks. Exercises included shoulder flexion, extension, adduction, abduction, rotational activities, elbow flexion, elbow extension, wrist flexion, wrist extension and gripping activities. The intensity started with basic range of motion exercises and progress to functional task. There were 15 repetitions of each exercise.
Comparator	Usual care N=8 Same exercises, but the mirror is covered.

Number of participants	16.
Duration of follow-up	2 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 8)

Mirror therapy with parasagital mirror frequency of 30 minute/daily, 5 days/week and four weeks. Exercises included shoulder flexion, extension, adduction, abduction, rotational activities, elbow flexion, elbow extension, wrist flexion, wrist extension and gripping

activities. The intensity started with basic range of motion exercises and progress to functional task. There were 15 repetitions of each exercise.

Usual care (N = 8)

Same exercises, but the mirror is covered.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 16)**
% Female Nominal	NR
Mean age (SD) Mean (SD)	NR (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke	NR

Characteristic	Study (N = 16)
Nominal	
Time period since stroke Nominal	NR

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 2 week, N = 8	Usual care, Baseline, N = 8	Usual care, 2 week, N = 8
Fugl-Meyer Upper Limb Motor Assessment total score Scale range: 0-66. Final value. Mean (SD)	10 (9.07)	60.13 (3.27)	8.75 (14.49)	29.25 (5.75)

Fugl-Meyer Upper Limb Motor Assessment total score - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-FuglMeyerUpperLimbMotorAssessmenttotalscore-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Marquez, 2012

Bibliographic Reference	Marquez, JL; Hollingsworth, SE; Lancaster, M; It's all just stroke and mirrors! The clinical implementation of mirror therapy to restore lower limb function and mobility following stroke and traumatic brain injury; Cerebrovascular Diseases; 2012; vol. 33; 843

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Australia.
Study setting	Inpatient rehabilitation unit.
Study dates	Not stated.
Sources of funding	National Stroke Foundation, Australia.
Inclusion criteria	First-ever neurological injury < 8 weeks, affected dorsiflexion strength of < Grade 3, ambulatory prior to admission
Exclusion criteria	Impaired cognition (MoCA < 21), peripheral neuropathy, impaired ROM of the intact lower limb, medically unfit for rehabilitation
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=5 Mirror therapy. Alternate ankle dorsiflexion and plantarflexion of both ankles as best they could while looking into the mirror for 15 minutes during the individual physiotherapy sessions. Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day.
Comparator	Usual care/sham therapy N=10 Two arms. 5 received sham mirror therapy (same as mirror therapy but with the non-reflecting side of the mirror) or individual physiotherapy only. Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day.
Number of participants	15.
Duration of follow-up	3 weeks and 6 weeks (3 weeks is used in the analysis as this is the closest to post-intervention).

Additional comments	Paper not available. Information was taken from the Cochrane review only.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 5)

Mirror therapy. Alternate ankle dorsiflexion and plantarflexion of both ankles as best they could while looking into the mirror for 15 minutes during the individual physiotherapy sessions. Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day.

Usual care/sham therapy (N = 10)

Two arms. 5 received sham mirror therapy (same as mirror therapy but with the non-reflecting side of the mirror) or individual physiotherapy only. Individual physiotherapy sessions were provided for 3 weeks, 5 days a week for 45 minutes a day.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 15)**
% Female Nominal	8
Mean age (SD) Mean (SD)	68.7 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	10
Haemorrhagic	5

Characteristic	Study (N = 15)
Nominal	
Time period since stroke (days) Mean (SD)	24.3 (NR)
Left Nominal	9
Right Nominal	6

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to usual care/sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 5	Mirror therapy, 3 week, N = 5	Usual care/sham therapy, Baseline, N = 10	Usual care/sham therapy, 3 week, N = 10
Lower limb motor function (Motor Assessment Scale Item 5) Scale range: 0-6. Final value. Mean (SD)	NR (NR)	1 (1.4)	NR (NR)	0.8 (1.4)

Outcome	Mirror therapy, Baseline, N = 5	Mirror therapy, 3 week, N = 5	Usual care/sham therapy, Baseline, N = 10	Usual care/sham therapy, 3 week, N = 10
Motor impairment (muscle strength) (unclear) Final value. Mean (SD)	NR (NR)	3.6 (5)	NR (NR)	6.3 (4.5)

Lower limb motor function (Motor Assessment Scale Item 5) - Polarity - Higher values are better

Motor impairment (muscle strength) - Polarity - Higher values are better

Mirror therapy compared to usual care/sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 5	Mirror therapy, 3 week, N = 5	Usual care/sham therapy, Baseline, N = 10	Usual care/sham therapy, 3 week, N = 10
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcare/shamtherapyatendofintervention-continuousoutcomes-Lowerlimbmotorfunction(MotorAssessmentScaleItem5)-MeanSD-Mirror therapy-Usual care/sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcare/shamtherapyatendofintervention-continuousoutcomes-Motorimpairment(musclestrength)-MeanSD-Mirror therapy-Usual care/sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcare/shamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care/sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Mathieson, 2018

Bibliographic Reference	Mathieson, S.; Parsons, J.; Kaplan, M.; Parsons, M.; Combining functional electrical stimulation and mirror therapy for upper limb motor recovery following stroke: a randomised trial; European Journal of Physiotherapy; 2018; vol. 20 (no. 4); 244-249

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	Australian New Zealand Clinical Trials Registry: ACTRN12608000027314.
Study type	Randomised controlled trial (RCT)
Study location	New Zealand.
Study setting	People on a stroke unit.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	People on a stroke unit who were over 18 years; admitted to hospital with a confirmed diagnosis of stroke; Montreal Cognitive Assessment Score of greater than 16/30; Action Research Arm Test score of <30/57; expected length of stay within the stroke unit of at least 10 days.
Exclusion criteria	No additional information.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=23 Combined functional electrical stimulation with mirror therapy. Mirror therapy was provided 30-minute mirror therapy sessions with a physiotherapist twice a day, five days a week for three weeks. Participants also received two 30 minute

	sessions of task-specific training each day, as per usual care. Mirror therapy sessions involved simple wrist extension performed with the unaffected upper limb while attempting to mimic these movements with the affected upper limb within the mirror box. This was combined with functional electrical stimulation within the mirror box. Hence, wrist extension was achieved int he affected upper limb while the participant views the reflection of the normal movement patterns of their unaffected upper limb. The parameters were: rate of 45Hz, pulse width 200 microseconds using a synchronous current, ramp up (1 sec), ramp down (0.8 sec), and overall work:rest ratio (8 sec:8 sec) and was constant throughout the study. Surface electrodes were placed on reproducible motor points over the extensor digitorum and extensor polliics bevis of the affected arm.
Comparator	Usual care N=12 Functional electrical stimulation only for the same time period. A third group received mirror therapy only (N=15). This group was not included in the analysis as it was not comparable to the usual care arm.
Number of participants	55.
Duration of follow-up	3 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 23)

Combined functional electrical stimulation with mirror therapy. Mirror therapy was provided 30-minute mirror therapy sessions with a physiotherapist twice a day, five days a week for three weeks. Participants also received two 30 minute sessions of task-specific training each day, as per usual care. Mirror therapy sessions involved simple wrist extension performed with the unaffected upper limb while attempting to mimic these movements with the affected upper limb within the mirror box. This was combined with functional electrical stimulation within the mirror box. Hence, wrist extension was achieved int he affected upper limb while the participant views the reflection of the normal movement patterns of their unaffected upper limb. The parameters were: rate of 45Hz, pulse width 200 microseconds using a synchronous current, ramp up (1 sec), ramp down (0.8 sec), and overall work:rest ratio (8 sec:8 sec) and was constant throughout the study. Surface electrodes were placed on reproducible motor points over the extensor digitorum and extensor polliics bevis of the affected arm.

Usual care (N = 12)

Functional electrical stimulation only for the same time period.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 23)	Usual care (N = 12)
% Female Nominal	10	5
Mean age (SD) Mean (SD)	73.35 (10.43)	72.42 (15.09)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic stroke Nominal	19	8
Haemorrhagic stroke Nominal	4	4
Time period since stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 23	Mirror therapy, 3 week, N = 23	Usual care, Baseline, N = 12	Usual care, 3 week, N = 12
Upper limb motor function (Action Research Arm Test) Scale range: 0-57. Final value. Mean (SD)	6.39 (10.36)	15.3 (13.1)	5.3 (10.59)	17.5 (14.3)
Fugl Meyer Assessment Upper Extremity Scale range: 0-66. Final value. Mean (SD)	12.74 (15.19)	21.4 (17.2)	10.38 (14.41)	28.4 (25.83)
Activities of daily living (functional independence measure) Scale range: 18-126 Mean (SD)	47.35 (16.85)	64.2 (18.9)	51 (20.08)	65.9 (18.8)

Upper limb motor function (Action Research Arm Test) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

Activities of daily living (functional independence measure) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 23	Mirror therapy, 3 week, N = 23	Usual care, Baseline, N = 12	Usual care, 3 week, N = 12
Dropouts Nominal	NA	1	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(ActionResearchArmTest)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Mekbib, 2021

Bibliographic Reference	Mekbib, D. B.; Debeli, D. K.; Zhang, L.; Fang, S.; Shao, Y.; Yang, W.; Han, J.; Jiang, H.; Zhu, J.; Zhao, Z.; Cheng, R.; Ye, X.; Zhang, J.; Xu, D.; A novel fully immersive virtual reality environment for upper extremity rehabilitation in patients with stroke; Annals of the New York Academy of Sciences; 2021; vol. 14; 14

Study details

Secondary publication of another included study- see primary study for details	No additional information.

Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	The Department of Rehabilitation Medicine at Zhejiang Province People's Hospital (Hangzhou, China).
Study dates	September 2018 and December 2019.
Sources of funding	This work was supported in part by a grant sponsored by the China National Key R&D Program (No. 2017YFC1308500/2017YFC1308502) and in part by the China National Natural Science Foundation (Grants: 71971066, 81430010, and 31627802). The work was also supported partly by an international collaboration grant sponsored by the China National Ministry of Science and Technology (No. 4-9/2018), and a grant sponsored by the China National Ministry of Education (No. 18YJA630019).
Inclusion criteria	Moderate-to-severe upper extremity impairments as a result of the first episode of ischaemic or haemorrhagic stroke; stroke duration not exceeding 3 months after stroke; adults (older than 18 years); normal hearing and vision, allowing smooth communication.
Exclusion criteria	Severe cognitive impairments based on the Mini-Mental State Examination score of above 16.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=12 Virtual reality with a device capable of mirror therapy interventions. The virtual reality group underwent the newly designed intervention plus occupational therapy. Virtual reality rehabilitation training included reaching, grasping and releasing tasks based on limb mirroring therapy and affected limb therapy. Following the training, all people in the virtual reality group received 1 hour virtual reality plus 1 hour occupational therapy per day, 4 days per week for 2 weeks. In each virtual reality session, the therapy modes were set by a therapist on the basis of patient's interest and actual motor capability. After

	choosing the therapy mode, the therapist randomly set 20 coloured balls from the aerial view map. Then, the patient was instructed to reach, grasp and release each ball into the basket. After completing the first VR session (20 balls), the therapist could set the next virtual reality session and adjust the task complexity to be slightly higher, lower, or keep it as it was in the previous session on the basis of the patient's activity performance.
Comparator	Usual care N=11 Occupational therapy only. Received time-matched occupational therapy alone. This intervention was aimed at minimizing spasticity and normalized movement patterns. The intervention included daily living activities, balance control, gait training, weight shifts, and distal and proximal upper extremity functional movements. The treatment was administered 2 hours per day, 4 days per week for 2 weeks.
Number of participants	23
Duration of follow-up	2 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 12)

Virtual reality with a device capable of mirror therapy interventions. The virtual reality group underwent the newly designed intervention plus occupational therapy. Virtual reality rehabilitation training included reaching, grasping and releasing tasks based on limb mirroring therapy and affected limb therapy. Following the training, all people in the virtual reality group received 1 hour virtual reality plus 1 hour occupational therapy per day, 4 days per week for 2 weeks. In each virtual reality session, the therapy modes were set by a therapist on the basis of patient's interest and actual motor capability. After choosing the therapy mode, the therapist randomly set 20 coloured balls from the aerial view map. Then, the patient was instructed to reach, grasp and release each ball into the basket. After completing the first VR session (20 balls), the therapist could set the next virtual reality session and adjust the task complexity to be slightly higher, lower, or keep it as it was in the previous session on the basis of the patient's activity performance.

Usual care (N = 11)

Occupational therapy only. Received time-matched occupational therapy alone. This intervention was aimed at minimizing spasticity and normalized movement patterns. The intervention included daily living activities, balance control, gait training, weight shifts, and distal and proximal upper extremity functional movements. The treatment was administered 2 hours per day, 4 days per week for 2 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 12)	Usual care (N = 11)
% Female Nominal	3	3
Mean age (SD) Mean (SD)	52.17 (13.26)	61 (7.69)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	9	8
Haemorrhagic Nominal	3	3
Time period since stroke (days) Mean (SD)	36.92 (22.04)	39.36 (18.08)

Characteristic	Mirror therapy (N = 12)	Usual care (N = 11)
Left Nominal	7	7
Right Nominal	5	4

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 2 week, N = 12	Usual care, Baseline, N = 14	Usual care, 2 week, N = 11
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	9.25 (3.84)	12.25 (4.58)	6.6 (2.17)	7.7 (2.54)
Activites of daily living (Barthel Index) Scale range: 0-100. Final value. Mean (SD)	28.18 (7.17)	32.27 (6.84)	24 (5.68)	28 (7.15)

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Activites of daily living (Barthel Index) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 14	Mirror therapy, 2 week, N = 14	Usual care, Baseline, N = 14	Usual care, 2 week, N = 14
Dropouts Nominal	NR	2	NR	3

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitesofdailyliving(BarthelIndex)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Michielsen, 2011

Bibliographic Reference	Michielsen, Marian E; Selles, Ruud W; van der Geest, Jos N; Eckhardt, Martine; Yavuzer, Gunes; Stam, Henk J; Smits, Marion; Ribbers, Gerard M; Bussmann, Johannes BJ; Motor recovery and cortical reorganization after mirror therapy in chronic stroke patients: a phase II randomized controlled trial; Neurorehabilitation and neural repair; 2011; vol. 25 (no. 3); 223-233

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with	NR

this study included in review	
Trial name / registration number	NR
Study location	Netherlands
Study setting	Home
Study dates	NR
Sources of funding	Fonds NutsOhra [SNO-T-0602-23]; Innovatiefonds Zorgverzekeraars [06-262]; Weten-schappelijk College Fysiotherapie [WU/2007/07] and Hersenstichting Nederland [15F07.54]
Inclusion criteria	Knowledge of Dutch language, Brunnstrom score upper extremity between 3 and 5; home dwelling status; at least 1 year post-stroke
Exclusion criteria	neglect; comorbidities that influenced upper extremity usage; history of multiple strokes
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy participants were instructed to move both arms while looking in the mirror (moving arm covered). Once a week physiotherapeutic supervision for 60 minutes; 5 times a week, 60 minutes of practice at home for 6 weeks
Comparator	Bilateral arm training: participants performed the same treatment protocol as in group 1, but without a mirror
Number of participants	40
Duration of follow-up	6 months
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Mixed
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

mirror therapy (N = 20)

control - arm training (N = 20)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 40)**
% Female Nominal	20

Characteristic	Study (N = 40)
Mean age (SD) Mean (SD)	57 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischaemic Nominal	28
Time period since stroke (years) Mean (SD)	4.6 (NR)
side of paresis (left) Nominal	28

Outcomes

Study timepoints

- Baseline
- 6 week (post intervention approx 6 weeks)

- 6 month

all outcomes

Outcome	mirror therapy, Baseline, N = 20	mirror therapy, 6 week, N = 17	mirror therapy, 6 month, N = 16	control - arm training, Baseline, N = 20	control - arm training, 6 week, N = 19	control - arm training, 6 month, N = 16
motor function (Action research arm test) 0-57 Mean (SD)	323.8 (15.8)	25.5 (17.4)	24.6 (18.7)	20.6 (17)	21.1 (16.8)	20.9 (17.6)
motor impairment (grip force) (kg) Mean (SD)	11.2 (7.8)	12.3 (9.9)	11.6 (5.7)	15.4 (9.7)	15.2 (8.5)	15.3 (8.4)
Fugl Meyer Assessment Upper Extremity 0-66 Mean (SD)	39.7 (14.1)	43.5 (14)	41.1 (14.9)	36.4 (14.7)	36.6 (14.2)	36.3 (16.2)
Pain (visual analog scale) (0 - 100) Mean (SD)	9.3 (19)	8.8 (10.8)	8 (12.8)	12.3 (21.6)	9.2 (14.1)	14.9 (25.3)
QOL (EQ-5D) Mean (SD)	0.75 (0.11)	0.76 (0.13)	0.76 (0.2)	0.75 (0.18)	0.81 (0.12)	0.79 (0.14)

Outcome	mirror therapy, Baseline, N = 20	mirror therapy, 6 week, N = 17	mirror therapy, 6 month, N = 16	control - arm training, Baseline, N = 20	control - arm training, 6 week, N = 19	control - arm training, 6 month, N = 16
Dropouts No of events	n = 3	*empty data*	*empty data*	n = 1	*empty data*	*empty data*

motor function (Action research arm test) - Polarity - Higher values are better

motor impairment (grip force) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity - Polarity - Higher values are better

Pain (visual analog scale) - Polarity - Lower values are better

QOL (EQ-5D) - Polarity - Higher values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

alloutcomes-Dropouts-NoOfEvents-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-motorimpairment(gripforce)-MeanSD-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-motorfunction(Actionresearcharmtest)-MeanSD-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-Pain(visualanalogscale)-MeanSD-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-QOL(EQ-5D)-MeanSD-mirror therapy-control - arm training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-QOL(EQ-5D)-MeanSD-mirror therapy-control - arm training

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-Pain(visualanalogscale)-MeanSD-mirror therapy-control - arm training-

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-FuglMeyerAssessmentUpperExtremity-MeanSD-mirror therapy-control - arm training-

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-motorimpairment(gripforce)-MeanSD-mirror therapy-control - arm training-

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

alloutcomes-motorfunction(Actionresearcharmtest)-MeanSD-mirror therapy-control - arm training-

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mohan, 2013

Bibliographic Reference	Mohan, Uthra; Effectiveness of mirror therapy on lower extremity motor recovery, balance and mobility in patients with acute stroke: a randomized sham-controlled pilot trial; Annals of Indian Academy of Neurology; 2013; vol. 16 (no. 4); 634

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India
Study setting	inpatient rehabilitation centre
Study dates	NR
Sources of funding	not financed (according to authors)
Inclusion criteria	1st episode of unilateral stroke with hemiparesis (onset ≤ 2 weeks), able to under-stand and follow simple verbal instructions, Brunnstrom recovery stage 2 and above, no severe cognitive disorders that would interfere with the study's purpose (MMSE score > 23), stable medical condition to allow participation in the study, ambulatory before stroke
Exclusion criteria	Neglect, Pusher syndrome, visual deficits, and history of multiple stroke, or comorbidities that influenced lower extremity usage
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: unaffected lower limb movements (hip-knee-ankle flexion, with the hip and knee placed in flexion, moving the knee inward and outward, hip abduction with external rotation followed by hip adduction with internal rotation, hip-knee-ankle flexion, knee extension with ankle dorsiflex-ion, knee flexion beyond 90 ° (each exercise was performed in 2 sets of

	10 repetitions). Plus conventional stroke rehabilitation programme: neurodevelopmental facilitation techniques, sensory motor re-education, active exercises, mobility training, balance, and gait training 2 weeks, 6 days a week, 60 minutes a day and additional 30 minutes of mirror therapy.
Comparator	Sham therapy as per intervention above: using non-reflecting surface of the mirror. Plus conventional stroke rehabilitation programme: neurodevelopmental facilitation techniques, sensory motor re-education, active exercises, mobility training, balance, and gait training. 2 weeks, 6 days a week, 60 minutes a day and additional 30 minutes of sham therapy
Number of participants	22
Duration of follow-up	2 weeks
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Subgroup analysis - further details	

Study arms

Mirror therapy lower limb (N = 11)

Sham mirror therapy lower limb (N = 11)

Characteristics

Study-level characteristics

Characteristic	Study (N = 22)
% Female Nominal	10
Mean age (SD) Mean (SD)	63 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR

Characteristic	Study (N = 22)
Severity Nominal	NR
Type of stroke Nominal	14
Time period since stroke (days) Mean (SD)	6.4 (NR)
side of paresis (left) Nominal	6

Outcomes

Study timepoints

- Baseline
- 2 week

2 week outcomes

Outcome	Mirror therapy lower limb, Baseline, N = 11	Mirror therapy lower limb, 2 week, N = 11	Sham mirror therapy lower limb, Baseline, N = 11	Sham mirror therapy lower limb, 2 week, N = 11
Motor function (Brunnel Balance Assessment) 0-12 Mean (SD)	3.45 (1.37)	5.4 (0.81)	2.55 (1.37)	3.45 (1.37)
motor impairment (Fugl Meyer assessment lower extremity) 0-34 Mean (SD)	19.36 (4.11)	25.36 (2.25)	11.36 (6.73)	17.36 (5.5)
Dropouts No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0
Adverse events No of events	n = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Motor function (Brunnel Balance Assessment) - Polarity - Higher values are better

motor impairment (Fugl Meyer assessment lower extremity) - Polarity - Higher values are better

Dropouts - Polarity - Lower values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

2weekoutcomes-Motorfunction(BrunnelBalanceAssessment)-MeanSD-Mirror therapy lower limb-Sham mirror therapy lower limb-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

2weekoutcomes-motorimpairment(FuglMeyerassessmentlowerextremity)-MeanSD-Mirror therapy lower limb-Sham mirror therapy lower limb-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

2weekoutcomes-Dropouts-NoOfEvents-Mirror therapy lower limb-Sham mirror therapy lower limb-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

2weekoutcomes-Adverseevents-NoOfEvents-Mirror therapy lower limb-Sham mirror therapy lower limb-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Moustapha, 2012

Bibliographic Reference	Moustapha, A; Rousseaux, M; Immediate effects of mirror therapy on spatial neglect; Annals of Physical and Rehabilitation Medicine; 2012; (no. 55); e197

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	France
Study setting	NR

Study dates	NR
Sources of funding	NR
Inclusion criteria	neglect (according to Negligence Evaluation Battery) secondary to a unilateral stroke of the right hemisphere
Exclusion criteria	other concomitant cerebral injuries, Illetrism or cognitive dysfunction altering com-prehension
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: sequence of analytical movements with right upper limb while looking to the image in the mirror - 5 days a week, 30 minutes a day for 5 consecutive days, 1 session a day. 1 week wash out then sham therapy for 5 days.
Comparator	Sham therapy: the image of the right arm was replaced by landscape images, participants were asked to describe the images in the mirror, no movement - 5 days a week, 30 minutes a day for 5 consecutive days, 1 session a day. 1 week wash out period then received mirror therapy protocol for 5 consecutive days .
Number of participants	8
Duration of follow-up	before and after each session - intervention lasted 5 days
Additional comments	abstract only - cross over design but cochrane analysed first phase only as parallel RCT
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 4)

sham mirror therapy (N = 4)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 8)**
% Female Nominal	4
Mean age (SD) Mean (SD)	53.5 (NR)
Ethnicity	NR

Characteristic	Study (N = 8)
Nominal	
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke months Mean (SD)	4.5 (NR)
side of paresis (left) Nominal	4

Outcomes

Study timepoints

- Baseline
- 5 day

post intervention outcomes

Outcome	Mirror therapy, Baseline, N = 4	Mirror therapy, 5 day, N = 3	sham mirror therapy, Baseline, N = 4	sham mirror therapy, 5 day, N = 3
Dropouts No of events	n = 1	*empty data*	n = 1	*empty data*
Visuospatial neglect (Star Cancellation Test) Mean (SD)	37.3 (NR)	37.3 (18.3)	NR (NR)	29 (20.3)

Dropouts - Polarity - Lower values are better

Visuospatial neglect (Star Cancellation Test) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postinterventionoutcomes-VisuospatialNeglect(StarCancellationTest)-MeanSD-Mirror therapy-sham mirror therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(cross over RCT with first phase analysed as parallel RCT)*

postinterventionoutcomes-Dropouts-NoOfEvents-Mirror therapy-sham mirror therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(cross over RCT with first phase analysed as parallel RCT)*

Nagapattinam, 2015

Bibliographic Reference	Nagapattinam, Sumana; Babu, Vinod K; Kumar, Sai N; Ayyappan, VR; Effect of task specific mirror therapy with functional electrical stimulation on upper limb function for subacute hemiplegia; International Journal of Physiotherapy; 2015; vol. 2 (no. 5); 840-849

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India

Study setting	hospital
Study dates	NR
Sources of funding	NR
Inclusion criteria	Unilateral hemiplegic stroke, between 6 weeks and 6 months post-stroke, ischaemic stroke, age 18 to 60 years, both men and women, BRS 2 - 5, modified AS ≥ 1, voluntary extension of wrist and fingers of at least 10 ° from the resting position
Exclusion criteria	> 60 years of age, BRS 1 or 6, wrist and/or finger contracture, cardiac pacemaker or other metal implants, significant visual, auditory and cognitive impairment
Recruitment / selection of participants	NR
Intervention(s)	Task-oriented MT: bilateral active wrist extension and fingers extension in mid-prone and pronated forearm, task-specific grasping and releasing of a bottle while looking to the image of the unaffected hand in the mirror. 2 weeks, 6 days a week, 30 minutes daily. Plus conventional therapy. Task-oriented MT plus FES: participants were instructed to observe the mirror reflection and asked to perform simultaneous bilateral movements with the affected limb performing synchronously with the duty cycle of electrical stimulation. 2 weeks, 6 days a week, 30 minutes daily. Plus conventional therapy.
Comparator	FES: electrodes placed on wrist extensors of the affected upper limb, participants were instructed to look into the opaque side of the mirror while the stimulation was given and was asked to perform the following exercises synchronously with the duty cycle of the stimulation, parameters of stimulation: frequency 35 Hz, pulse width 250s, symmetrical biphasic waveform, duty cycle of 5 secs on and 5secs off, amplitude adjusted to maximal tolerance of the participant up to 90 m. 2 weeks, 6 days a week, 30 minutes daily. Plus conventional therapy.

Number of participants	60
Duration of follow-up	post intervention 2 weeks
Additional comments	3 arm study - both mirror therapy groups are combined so MT plus FES
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	

Study arms

task-orientated mirror therapy plus Mirror therapy with FES (N = 40)

Cochrane combined 2 mirror therapy arms (task orientated mirror therapy with mirror therapy plus FES) 20 in each arm

FES (N = 20)

Characteristics

Study-level characteristics

Characteristic	Study (N = 60)
% Female Nominal	20
Mean age (SD) Mean (SD)	44.9 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Ischaemic Nominal	60
Time period since stroke (Months)	4.2 (NR)

Characteristic	Study (N = 60)
Mean (SD)	
Side of paresis Nominal	NR

Outcomes

Study timepoints

- Baseline
- 2 week

post intervention outcome

Outcome	task-orientated mirror therapy plus Mirror therapy with FES, Baseline, N = 40	task-orientated mirror therapy plus Mirror therapy with FES, 2 week, N = 40	FES, Baseline, N = 20	FES, 2 week, N = 20
Motor function (ARAT total) 0-57 Mean (SD)	21.5 (9.3)	28.7 (11.5)	23.2 (10.5)	28.4 (9.1)
Dropouts No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Motor function (ARAT total) - Polarity - Higher values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postinterventionoutcome-Motorfunction(ARATtotal)-MeanSD-task-orientated mirror therapy plus Mirror therapy with FES-FES-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with mirror therapy plus FES)*

postinterventionoutcome-Dropouts-NoOfEvents-task-orientated mirror therapy plus Mirror therapy with FES-FES-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(combines mirror therapy with mirror therapy plus FES)*

Oliveira, 2018

Bibliographic Reference	Oliveira, Mdcb; Silva, D. R. C.; Cortez, B. V.; Coelho, Ckds; Silva, Fmse; de Oliveira, Gbvp; de Sa-Caputo, D. C.; Tavares-Oliveira, A. C.; Bernardo-Filho, M.; Moraes Silva, J.; Mirror and Vibration Therapies Effects on the Upper Limbs of Hemiparetic Patients after Stroke: A Pilot Study; Rehabilitation Research & Practice Print; 2018; vol. 2018; 6183654

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Brazil.
Study setting	The Clinical School of Faculdada Mauricio de Nassau, Teresina, PI, Brazil.
Study dates	August to December 2014
Sources of funding	No additional information.
Inclusion criteria	People with hemiparesis of the upper limb aged between 45 and 75; any gender; diagnosis of stroke with the minimum of 12 months of sequel or spastic phase established; absence of cognitive limitations; spasticity 1, 1+ or 2 on the modified Ashworth Scale and lack of orthopaedic disorders in upper limb paretic.
Exclusion criteria	People with cardiorespiratory disorders; dysphasia; Wernicke's aphasia; use of muscle relaxants; people with contraindications for use of vibration.
Recruitment / selection of participants	Enrolled by a convenience sample according to availability and accessibility.
Intervention(s)	Mirror therapy N=7

	Bimanual activities of a protocol (2 sets of 10 repetitions with flexion and extension of the shoulder, elbow and wrist; abduction and adduction of the shoulder; pronation and supination of the elbow; flexion with horizontal abduction and flexion with horizontal adduction of shoulders; flexion and extension of the elbow in supine position with the palm of closed hand and with opponency of the fingers, drawing in the air a circle, a triangle, a square and a rectangle, in the seated position on a chair. On the chair a mirror was placed interposed laterally between the upper and lower front of the chest. People were asked to observe the healthy limb through the reflection of the mirror and to perform the same activities with the paretic limb.
Comparator	Usual care N=7 Conventional physiotherapy for the rehabilitation of stroke. A third group (N=7) received vibratory therapy using a Digital Vibration Pad. This group was not included in the analysis as it did not fulfil the comparisons stated in the protocol.
Number of participants	21 (14 included in the analysis).
Duration of follow-up	3 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 7)

Bimanual activities of a protocol (2 sets of 10 repetitions with flexion and extension of the shoulder, elbow and wrist; abduction and adduction of the shoulder; pronation and supination of the elbow; flexion with horizontal abduction and flexion with horizontal adduction of shoulders; flexion and extension of the elbow in supine position with the palm of closed hand and with opponency of the fingers, drawing in the air a circle, a triangle, a square and a rectangle, in the seated position on a chair. On the chair a mirror was placed interposed laterally between the upper and lower front of the chest. People were asked to observe the healthy limb through the reflection of the mirror and to perform the same activities with the paretic limb.

Usual care (N = 7)

Conventional physiotherapy for the rehabilitation of stroke.

Characteristics

Study-level characteristics

Characteristic	Study (N = 21)
% Female Nominal	13
Mean age (SD) Range	55 to 65
Mean age (SD) Mean (SD)	60.1 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Nominal	NR

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention.)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 7	Mirror therapy, 3 week, N = 7	Usual care, Baseline, N = 7	Usual care, 3 week, N = 7
Motor impairment (Rivermead Mobility Index) Scale range: 0-15. Final values. Reports means and p-values (between group). Mean (p value)	8.9 (0.15)	13.3 (0.003)	10.1 (0.15)	10.6 (0.003)
Lower limb motor function (Wolf Motor Function Test) (Minutes) Scale range: 0-30. Final value. Reports means and p-values (between group). Mean (p value)	22.5 (0.18)	15.4 (0.01)	22.4 (0.18)	22.6 (0.001)

Motor impairment (Rivermead Mobility Index) - Polarity - Higher values are better

Lower limb motor function (Wolf Motor Function Test) - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorimpairment(RivermeadMobilityIndex)-MeanPValue-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Lowerlimbmotorfunction(WolfMotorFunctionTest)-MeanPValue-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Pandian, 2014

Bibliographic Reference	Pandian, Jeyaraj D; Arora, Rajni; Kaur, Paramdeep; Sharma, Deepika; Vishwambaran, Dheeraj K; Arima, Hisatomi; Mirror therapy in unilateral neglect after stroke (MUST trial): a randomized controlled trial; Neurology; 2014; vol. 83 (no. 11); 1012-1017

Study details

Secondary publication of	NR

another included study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	MUST trial
Study location	India
Study setting	inpatient rehabilitation centre and home training after discharge
Study dates	January 2011 to August 2013
Sources of funding	Christian Medical College, Department of Neurology, India, Intramural research fund
Inclusion criteria	
Exclusion criteria	Glasgow Coma Scale score < 7, un-cooperative patients
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: bilateral flexion and extension of wrist and fingers, active or assistive limb activation (tapping the affected hand or fingers on a plain surface and goal-oriented activities (combing, tying turban (for men), wearing garments, picking up objects and placing them on the table, pouring and drinking from a cup). 4 weeks, 5 days a week, 1 hour a day MT and 1 hour limb activation
Comparator	sham therapy: using non-reflecting surface of the mirror and active or assistive limb activation. 4 weeks, 5 days a week, 1 hour a day sham therapy and 1 hour limb activation.
Number of participants	48

Duration of follow-up	6 months
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Mixed
Subgroup 5: Limb therapy is used for	Both

Study arms

Mirror therapy (N = 27)

Sham mirror therapy (N = 21)

Characteristics

Study-level characteristics

Characteristic	Study (N = 48)
% Female Nominal	20
Mean age (SD) Mean (SD)	63.4 (NR)
Ethnicity Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	26
Time period since stroke (days) Mean (SD)	2 (NR)
Side of paresis Left Nominal	37

Outcomes

Study timepoints

- Baseline
- 6 month

outcomes as reported by cochrane at 6 months (original data unavilable)

Outcome	Mirror therapy, Baseline, N = 27	Mirror therapy, 6 month, N = 26	Sham mirror therapy, Baseline, N = 21	Sham mirror therapy, 6 month, N = 19
Activities of daily living (functional independence measure) 1-7 Mean (SD)	NR (*empty data*)	3.2 (1)	NR (*empty data*)	2.5 (0.8)
Visuospatial neglect (Star Cancellation Test) 0-54 Mean (SD)	NR (*empty data*)	37.8 (5.9)	NR (*empty data*)	24.1 (3.5)

Activities of daily living (functional independence measure) - Polarity - Higher values are better

Visuospatial neglect (Star Cancellation Test) - Polarity - Higher values are better

data taken directly from Cochrane as original study supplementary data unavailable

dichotomous outcomes at 6 months

Outcome	Mirror therapy, Baseline, N = 27	Mirror therapy, 6 month, N = 27	Sham mirror therapy, Baseline, N = 21	Sham mirror therapy, 6 month, N = 21
Dropouts	*empty data*	1	*empty data*	1

Outcome	Mirror therapy, Baseline, N = 27	Mirror therapy, 6 month, N = 27	Sham mirror therapy, Baseline, N = 21	Sham mirror therapy, 6 month, N = 21
Nominal				
Adverse events Nominal	*empty data*	0	*empty data*	0

Dropouts - Polarity - Lower values are better

Adverse events - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

outcomesasreportedbycochraneat6months(originaldataunavilable)-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

outcomesasreportedbycochraneat6months(originaldataunavilable)-Visuospatialneglect(StarCancellationTest)-MeanSD-Mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

dichotomousoutcomesat6months-Dropouts-Nominal-Mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

dichotomousoutcomesat6months-Adverseevents-Nominal-Mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Park, 2015

Bibliographic Reference	Park, Jin-Young; Chang, Moonyoung; Kim, Kyeong-Mi; Kim, Hee-Jung; The effect of mirror therapy on upper-extremity function and activities of daily living in stroke patients; Journal of physical therapy science; 2015; vol. 27 (no. 6); 1681-1683

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Republic of Korea
Study setting	Inpatient
Study dates	NR
Sources of funding	NR
Inclusion criteria	Diagnosis of hemiplegia due to stroke of at least a 6-month duration, scores of ≥ 24points on the MMSE-Korean (MMSE-K; no difficulty with cognitive functions), Brunnstrom's upper extremity stage IV, no difficulties with perceptual abilities including hemineglect based on the MVPT, voluntary consent to participate in the study
Exclusion criteria	NR
Recruitment / selection of participants	NR
Intervention(s)	Mirror therapy: movements of the non-paretic side - 4 weeks, 5 days a week, 30 minutes. Plus conventional occupational therapy
Comparator	Sham therapy: participants performed the same exercises as the MT group while watching the non-reflecting surface of the mirror - 4 weeks, 5 days a week, 30 minutes. Plus conventional occupational therapy

Number of participants	30
Duration of follow-up	after therapy - 4 weeks
Additional comments	
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 15)

Sham mirror therapy (N = 15)

Characteristics

Study-level characteristics

Characteristic	Study (N = 30)
% Female Nominal	13
Mean age (SD) Mean (SD)	56.3 (NR)
Ethnicity Nominal	NR
Comorbidities Mean (SD)	NR (*empty data*)
Severity Nominal	NR
Type of stroke Ischaemic Nominal	16
Time period since stroke (Months) Mean (SD)	20.9 (NR)

Characteristic	Study (N = 30)
side of paresis (left) Nominal	14

Outcomes

Study timepoints

- Baseline
- 4 week

post intervention 4 week outcomes

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Sham mirror therapy, Baseline, N = 15	Sham mirror therapy, 4 week, N = 15
Fugl-Meyer Motor Function Assessmen 0-66 Mean (SD)	NR (NR)	9.6 (2.66)	NR (NR)	4.93 (2.81)
Upper limb and hand motor function (Box and Block Test) 0-150 Mean (SD)	NR (NR)	7.86 (1.76)	NR (NR)	2.4 (5.87)
ADLs (Functional Independence Measure) 0-22	NR (NR)	8.8 (4.12)	NR (NR)	4.06 (4.92)

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Sham mirror therapy, Baseline, N = 15	Sham mirror therapy, 4 week, N = 15
Mean (SD)				

Fugl-Meyer Motor Function Assessmen - Polarity - Higher values are better

Upper limb and hand motor function (Box and Block Test) - Polarity - Higher values are better

ADLs (Functional Independence Measure) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

postintervention4weekoutcomes-FuglMeyerMotorFunctionAssessmen-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postintervention4weekoutcomes-Upperlimbandhandmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

postintervention4weekoutcomes-ADLs(FunctionalIndependenceMeasure)-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Park, 2015

Bibliographic Reference	Park, Youngju; Chang, Moonyoung; Kim, Kyeong-Mi; An, Duk-Hyun; The effects of mirror therapy with tasks on upper extremity function and self-care in stroke patients; Journal of physical therapy science; 2015; vol. 27 (no. 5); 1499-1501

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	South Korea
Study setting	rehabilitation unit

Study dates	NR
Sources of funding	NR
Inclusion criteria	Stroke > 3 months identifiable by CT or MRI, no cognitive dysfunction that would interfere with the study purpose as indicated by a MMSE-K > 24, no perceptual disorder or unilateral neglect that would have interfered with the study purpose as indicated by the MVPT, Brunnstrom score between stages I – IV for the UE
Exclusion criteria	aphasia, vision or hearing disorders, or had had MT previously
Recruitment / selection of participants	NR
Intervention(s)	Task-oriented mirror therapy: unilateral, performed 8 different tasks, e.g. lift/grasp a cup, reach to grasp a cone. 6 weeks, 5 days a week task-oriented MT.
Comparator	Sham therapy (covered mirror): same 8 tasks as intervention group. 6 weeks, 5 days a week task-oriented MT or sham therapy
Number of participants	30
Duration of follow-up	post intervention (6 weeks), 1 month post intervention (10 weeks)
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Task-oriented mirror therapy (N = 15)

Sham mirror therapy (N = 15)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
% Female Nominal	15
Mean age (SD) Mean (SD)	60 (NR)
Ethnicity Nominal	NR

Characteristic	Study (N = 30)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Ischaemic Nominal	17
Time period since stroke (Months) Mean (SD)	8.2 (NR)
Side of paresis left Nominal	17

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	Task-oriented mirror therapy, Baseline, N = 15	Task-oriented mirror therapy, 6 week, N = 15	Sham mirror therapy, Baseline, N = 15	Sham mirror therapy, 6 week, N = 15
Motor function (Manual Function Test) 0-32 Mean (SD)	25.6 (12.4)	49.4 (16.9)	26.7 (10.9)	37.3 (11.4)
Activities of daily living (functional independence measure - self care) 0-7 but does not correlate with results reported? Mean (SD)	17.1 (5.9)	24.5 (5.7)	17.3 (6.4)	20 (5)

Motor function (Manual Function Test) - Polarity - Higher values are better

Activities of daily living (functional independence measure - self care) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-Activitiesofdailyliving(functionalindependencemeasure-selfcare)-MeanSD-Task-oriented mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-Motorfunction(ManualFunctionTest)-MeanSD-Task-oriented mirror therapy-Sham mirror therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Piravej, 2012

Bibliographic Reference	Piravej, K; Champaiboon, J; Sontim, W; Ruengyoo, R; Effect of mirror therapy in recovering upper limb strength and function in chronic stroke patients; Neurorehabilitation and Neural Repair; 2012; vol. 26 (no. 6); abst126

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Thailand.

Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	1st stroke hemiparesis onset more than 3 months, age > 18 years, able to follow 2-step command, upper extremity Brunnstrom stage between 1 and 4, able to sit with or without support more than 30 minutes, cognitive function evaluated by MMSE i 24, no previous disease of the hemiparetic side.
Exclusion criteria	Unstable medical conditions, sensory or global aphasia, severe spasticity (mAS > 3), neglect of the hemiparetic side.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=23 Mirror therapy with task-oriented activity consisted of grasping and releasing the tennis balls, pins and cylindrical shape 30 minutes/session, 10 sessions.
Comparator	Sham therapy N=24 Same tasks without mirror (use the other side of the mirror box) 30 minutes/session, 10 sessions.
Number of participants	47.
Duration of follow-up	2 weeks (end of intervention) - follow up also at 4 weeks and 12 weeks.
Additional comments	Full text not available for analysis. Information taken from the Cochrane review only.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 23)

Mirror therapy with task-oriented activity consisted of grasping and releasing the tennis balls, pins and cylindrical shape 30 minutes/session, 10 sessions

Sham therapy (N = 24)

Same tasks without mirror (use the other side of the mirror box) 30 minutes/session, 10 sessions

Characteristics

Study-level characteristics

Characteristic	**Study (N = 47)**
% Female Nominal	19
Mean age (SD) Mean (SD)	56 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	27
Haemorrhagic Nominal	13
Time period since stroke (Months) Mean (SD)	7.2 (NR)

Characteristic	Study (N = 47)
Left Nominal	25
Right Nominal	15

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 23	Mirror therapy, 2 week, N = 20	Sham therapy, Baseline, N = 24	Sham therapy, 2 week, N = 20
Upper limb motor function (Brunnstorm stage of recovery) Scale range: Unclear. Final value. Mean (SD)	NR (NR)	0.6 (0.9)	NR (NR)	0.7 (0.7)
Motor impairment (tip and lateral pinch gauges) (unclear) Final value. Mean (SD)	NR (NR)	2.4 (0.8)	NR (NR)	2.5 (0.8)

Outcome	Mirror therapy, Baseline, N = 23	Mirror therapy, 2 week, N = 20	Sham therapy, Baseline, N = 24	Sham therapy, 2 week, N = 20
Activities of daily living (scale unclear) Scale range: unclear. Final value. Mean (SD)	NR (NR)	77.3 (12.6)	NR (NR)	68.8 (12.6)

Upper limb motor function (Brunnstorm stage of recovery) - Polarity - Higher values are better

Motor impairment (tip and lateral pinch gauges) - Polarity - Higher values are better

Activities of daily living (scale unclear) - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 23	Mirror therapy, 2 week, N = 23	Sham therapy, Baseline, N = 24	Sham therapy, 2 week, N = 24
Dropouts Nominal	NR	3	NR	4

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Upperlimbmotorfunction(Brunnstormstageofrecovery)-MeanSD-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Motorimpairment(tipandlateralpinchgauges)-MeanSD-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Activitiesofdailyliving(scaleunclear)-MeanSD-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Rajappan, 2015

Bibliographic Reference	Rajappan, Roshini; Abudaheer, Syed; Selvaganapathy, Karthikeyan; Gokanadason, Dineshrajan; Effect of mirror therapy on hemiparetic upper extremity in subacute stroke patients; International Journal of Physiotherapy; 2015; vol. 2 (no. 6); 1041-1046

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Malayasia.
Study setting	Nursing homes.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Men and women, age 50 to 70 years, 1st episode of unilateral stroke with hemiparesis, 2 to 12 months post-stroke, diagnosis of stroke with involvement of middle cerebral artery on MRI or CT scan by neurologist.

Exclusion criteria	MMSE < 24, uncontrolled systemic hypertension, perceptual or apraxic deficits, visual deficit such as homonymous hemianopia, reflex sympathetic dystrophy, severe shoulder subluxation, contracture in the affected upper limb and botox injection within past 6 months to the affected upper limb.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Bilateral finger flexion, extension, abduction, adduction; wrist flexion, extension, ulnar deviation and radial deviation; task-specific movements such as power and prehension grip using different size and weighted objects while looking into the mirror additional 30 minutes a day mirror therapy. Concomitant therapy: 4 weeks, 5 days a week, 1 hour a day conventional rehabilitation programme.
Comparator	Sham therapy N=15 Same tasks as MT but using the non-reflecting side of the mirror additional 30 minutes a day sham therapy. Concomitant therapy: 4 weeks, 5 days a week, 1 hour a day conventional rehabilitation programme.
Number of participants	30.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Bilateral finger flexion, extension, abduction, adduction; wrist flexion, extension, ulnar deviation and radial deviation; task-specific movements such as power and prehension grip using different size and weighted objects while looking into the mirror additional 30 minutes a day mirror therapy. Concomitant therapy: 4 weeks, 5 days a week, 1 hour a day conventional rehabilitation programme.

Sham therapy (N = 15)

Same tasks as MT but using the non-reflecting side of the mirror additional 30 minutes a day sham therapy. Concomitant therapy: 4 weeks, 5 days a week, 1 hour a day conventional rehabilitation programme.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 15)	Sham therapy (N = 15)
% Female Nominal	4	5
Mean age (SD) Mean (SD)	57.8 (5.3)	58.2 (5.7)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	9	11
Haemorrhagic Nominal	6	4

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Sham therapy, Baseline, N = 15	Sham therapy, 4 week, N = 15
Dropouts Nominal	NA	0	NA	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Rehani, 2015

Bibliographic Reference	Rehani, Puneet; Kumari, Reena; Midha, Divya; Effectiveness of motor relearning programme and mirror therapy on hand functions in patients with stroke-a randomized clinical trial; Int J Ther Rehabil Res; 2015; vol. 4; 20-4

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	Clinical Trial Database Number: NCT02338557.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	Outpatient.
Study dates	Not stated.
Sources of funding	No additional information.
Inclusion criteria	Age 45 to 65 years, 1st episode of ischaemic and haemorrhagic stroke, stroke between 1 to 6 months, men and women, MMSE > 23, BRS 4 and 5.
Exclusion criteria	Any musculoskeletal disorders, neurological disorder other than stroke, visual impairment, systemic disease, non-cooperative patients, psychological problems.

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Mirror therapy. Bilateral intransitive exercises such as hand opening, wrist extension and flexion, forearm pronation and supination, hand sliding on a flat surface while looking into the mirror. Conventional therapy was available for both study arms. Therapy was delivered for an additional 30 minutes a day of mirror therapy. Conventional therapy was delivered for 4 weeks, 6 days a week, 30 minutes a day.
Comparator	Usual care N=10 Motor relearning programme exercises for training of wrist extensors, extension of wrist and holding objects, training of supination of forearm, opposition of thumb, cupping of hand and training of manipulation of the objects. Conventional therapy was available for both study arms. Therapy was delivered for an additional 30 minutes a day of motor relearning programme. Conventional therapy was delivered for 4 weeks, 6 days a week, 30 minutes a day.
Number of participants	20
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 10)

Mirror therapy. Bilateral intransitive exercises such as hand opening, wrist extension and flexion, forearm pronation and supination, hand sliding on a flat surface while looking into the mirror. Conventional therapy was available for both study arms. Therapy was delivered for an additional 30 minutes a day of mirror therapy. Conventional therapy was delivered for 4 weeks, 6 days a week, 30 minutes a day.

Usual care (N = 10)

Motor relearning programme exercises for training of wrist extensors, extension of wrist and holding objects, training of supination of forearm, opposition of thumb, cupping of hand and training of manipulation of the objects. Conventional therapy was available for both study arms. Therapy was delivered for an additional 30 minutes a day of motor relearning programme. Conventional therapy was delivered for 4 weeks, 6 days a week, 30 minutes a day.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 10)	Usual care (N = 10)
% Female Sample size	n = 5 ; % = 46.2	n = 4 ; % = 38.5
Mean age (SD) Mean (SD)	57.85 (4.38)	54.77 (6.39)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Sample size	n = 6 ; % = 61.5	n = 7 ; % = 69.2
Haemorrhagic Sample size	n = 4 ; % = 38.5	n = 3 ; % = 30.8
Time period since stroke (days) Mean (SD)	92.38 (30.23)	74.38 (32.52)

Characteristic	Mirror therapy (N = 10)	Usual care (N = 10)
Left Sample size	n = 6 ; % = 61.5	n = 5 ; % = 46.2
Right Sample size	n = 4 ; % = 38.5	n = 5 ; % = 53.8

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 6	Usual care, Baseline, N = 10	Usual care, 4 week, N = 6
Upper limb motor function (Chedoke Arm and Hand Activity Inventory) Scale range: 13-91. Final value. Mean (SD)	27.67 (1.37)	59.33 (2.75)	27.5 (2.36)	57.5 (2.62)

Upper limb motor function (Chedoke Arm and Hand Activity Inventory) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
Dropouts Nominal	NA	4	NA	4

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Upperlimbmotorfunction(ChedokeArmandHandActivityInventory)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Rodrigues, 2016

Bibliographic Reference	Rodrigues, Letícia Cardoso; Farias, Nayara Correa; Gomes, Raquel Pinheiro; Michaelsen, Stella Maris; Feasibility and effectiveness of adding object-related bilateral symmetrical training to mirror therapy in chronic stroke: A randomized controlled pilot study; Physiotherapy theory and practice; 2016; vol. 32 (no. 2); 83-91

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Brazil.
Study setting	Home.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Stroke > 6 months, spasticity < 3 modified AS for horizontal shoulder adductors, elbow flexors, and wrist and finger flexors; FM-UE score 30 - 49 points

Exclusion criteria	Other neurological diseases, orthopaedic upper limb problems which interfered with their activity level, uncontrolled shoulder pain, significant uncorrectable visual impairment, aphasia or difficulty understanding simple tasks, visual hemineglect, those who were receiving other upper-limb interventions
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=8 Object-related bilateral symmetric upper limb training while looking into the mirror 4 weeks, 3 days a week, 1 hour a day mirror therapy.
Comparator	Sham therapy N=8 Object-related bilateral symmetric upper-limb training using covered mirror 4 weeks, 3 days a week, 1 hour a day sham therapy.
Number of participants	16.
Duration of follow-up	4 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 8)

Object-related bilateral symmetric upper limb training while looking into the mirror 4 weeks, 3 days a week, 1 hour a day mirror therapy.

Sham therapy (N = 8)

Object-related bilateral symmetric upper-limb training using covered mirror 4 weeks, 3 days a week, 1 hour a day sham therapy.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 8)	Sham therapy (N = 8)
% Female Nominal	4	2
Mean age (SD) (years)	58.4 (8.3)	56.6 (5.3)

Characteristic	Mirror therapy (N = 8)	Sham therapy (N = 8)
Mean (SD)		
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	8	8
Haemorrhagic Nominal	0	0
Time period since stroke (Months) Mean (SD)	33.5 (22.6)	36.1 (31.2)
Right Nominal	3	2
Left Nominal	5	6

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 4 week, N = 8	Sham therapy, Baseline, N = 8	Sham therapy, 4 week, N = 8
Upper limb motor function (The upper extremity performance test for the elderly [TEMPA]) Scale range: 0-186. Final value. Mean (SD)	56.4 (18.8)	51 (16.2)	45 (22.8)	32.5 (29)
Fugl Meyer Asessment Upper Extremiity Scale range: 0-66. Final value. Mean (SD)	36.3 (5.6)	41.4 (8.1)	40.6 (6.9)	46.8 (9.6)

Upper limb motor function (The upper extremity performance test for the elderly [TEMPA]) - Polarity - Lower values are better

Fugl Meyer Asessment Upper Extremiity - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 4 week, N = 8	Sham therapy, Baseline, N = 8	Sham therapy, 4 week, N = 8
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(Theupperextremityperformancetestfortheelderly[TEMPA])-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAsessmentUpperExtremiity-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Rong, 2021

Bibliographic Reference	Rong, Jifeng; Ding, Li; Xiong, Li; Zhang, Wen; Wang, Weining; Deng, Meikui; Wang, Yana; Chen, Zhen; Jia, Jie; Mirror Visual Feedback Prior to Robot-Assisted Training Facilitates Rehabilitation After Stroke: A Randomized Controlled Study.; Frontiers in neurology; 2021; vol. 12; 683703

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	ChiCTR1900023356
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Inpatients in the First Rehabilitation Hospital of Shanghai
Study dates	NR
Sources of funding	This research was funded by the National Key R&D Program of China (Grant Nos. 2018YFC2002300 and 2018YFC2002301), the National Natural Science Foundation of China (82002385), the Shanghai Sailing Program (20YF1403400), and the Shanghai Municipal Health Commission Scientific Research Project (202040023).
Inclusion criteria	Diagnosed as unilateral stroke for the first time; within 1 month to 6 months after stroke onset; age between 18 and 80 years.

Exclusion criteria	Severe cognitive impairment (MMSE ≤ 23); severe pain or sensory impairment.
Recruitment / selection of participants	All the subjects were inpatients, who were recruited from the First Rehabilitation Hospital of Shanghai, as a branch center of Huashan Hospital, from January 2019 to December 2020.
Intervention(s)	Mirror therapy N=20 Therapy for 1.5 hours per day, 5 days a week for 4 weeks. Camera-based mirror visual feedback during motor training and task training for 0.5 hours while instructing the person to focus on the screen and imagining that the reflection of their hand is their affected hand and to train while moving both arms synchronously. Subsequently 1 hour of robot arm training was performed using the Armeo Power device and four game-based settings. Concomitant therapy: No additional information.
Comparator	Sham mirror therapy N=20 Sham mirror therapy where the affected side was shielded to restrain the development of a mirror illusion. However, the same instructions were given and the therapy was provided for the same time. Subsequently the same amount of robot arm therapy was given. Concomitant therapy. No additional information.
Number of participants	40
Duration of follow-up	4 weeks
Additional comments	NR

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	NR

Study arms

Mirror therapy (N = 20)

Therapy for 1.5 hours per day, 5 days a week for 4 weeks. Camera-based mirror visual feedback during motor training and task training for 0.5 hours while instructing the person to focus on the screen and imagining that the reflection of their hand is their affected hand and to train while moving both arms synchronously. Subsequently 1 hour of robot arm training was performed using the Armeo Power device and four game-based settings. Concomitant therapy: No additional information.

Sham mirror therapy (N = 20)

Sham mirror therapy where the affected side was shielded to restrain the development of a mirror illusion. However, the same instructions were given and the therapy was provided for the same time. Subsequently the same amount of robot arm therapy was given. Concomitant therapy. No additional information.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 20)**	**Sham mirror therapy (N = 20)**
% Female Sample size	n = 3 ; % = 15	n = 6 ; % = 30
Mean age (SD) (years) Mean (SD)	56.25 (12.29)	62.3 (13.1)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR

Characteristic	Mirror therapy (N = 20)	Sham mirror therapy (N = 20)
Time period since stroke (Months) Mean (SD)	3.65 (1.53)	3.85 (1.79)

Outcomes

Study timepoints

- Baseline
- 4 week

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Sham mirror therapy, Baseline, N = 20	Sham mirror therapy, 4 week, N = 20
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Final values. Mean (SD)	31.75 (13.12)	47.35 (11.81)	30.1 (12.43)	39.6 (12.21)
Activties of daily living (Modified Barthel index) Scale range: 0-100. Final values. Mean (SD)	58.5 (22.66)	71.75 (21.73)	52 (13.71)	62.9 (13.33)

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Sham mirror therapy, Baseline, N = 20	Sham mirror therapy, 4 week, N = 20
Measures of motor impairment (Grip strength) (kg) Final values. Mean (SD)	2.48 (0.78)	3.28 (0.65)	1.71 (1.38)	2.22 (1.03)

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Activties of daily living (Modified Barthel index) - Polarity - Higher values are better

Measures of motor impairment (Grip strength) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Sham mirror therapy, Baseline, N = 20	Sham mirror therapy, 4 week, N = 20
Drop out rate No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Drop out rate - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-FuglMeyerAssessmentUpperExtremity-finalvalues-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Activtiesofdailyliving(MBI)-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Dropoutrate-NoOfEvents-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Measuresofmotorimpairment(Gripstrength)-MeanSD-Mirror therapy-Sham mirror therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Rothgangel, 2004

Bibliographic Reference	Rothgangel, AS; Morton, AR; Van den Hout, JWE; Beurskens, AJHM; Phantoms in the brain: mirror therapy in chronic stroke patients; a pilot study; Nederlands Tijdschrift voor Fysiotherapie; 2004; vol. 114 (no. 2); 36-40

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Netherlands.
Study setting	Inpatient and outpatient rehabilitation centre.
Study dates	Not stated.

Sources of funding	Not stated.
Inclusion criteria	1st stroke in the territory of the middle cerebral artery; minimum 3 months poststroke; minimum score of 1 in the ARAT.
Exclusion criteria	Bilateral stroke; severe neglect; severe visual impairments.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=6 Participants were instructed to move either both arms (muscle hypotonia), or just the unaffected arm (muscle hypertonia); therapist was moving the affected arm; gross, functional and fine-motor movements were trained. Day hospital group (6 participants): 17 treatments during 5 weeks for 30 minutes each; inpatient rehabilitation group (10 participants): 37 treatments during 5 weeks for 30 minutes each (a mixture of these are available for the two interventions).
Comparator	Usual care N=10 Bilateral arm training: same treatment protocol as in group 1, but without a mirror. Day hospital group (6 participants): 17 treatments during 5 weeks for 30 minutes each; inpatient rehabilitation group (10 participants): 37 treatments during 5 weeks for 30 minutes each (a mixture of these are available for the two interventions). Edit
Number of participants	16
Duration of follow-up	5 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 6)

Participants were instructed to move either both arms (muscle hypotonia), or just the unaffected arm (muscle hypertonia); therapist was moving the affected arm; gross, functional and fine-motor movements were trained. Day hospital group (6 participants): 17 treatments during 5 weeks for 30 minutes each; inpatient rehabilitation group (10 participants): 37 treatments during 5 weeks for 30 minutes each (a mixture of these are available for the two interventions).

Usual care (N = 10)

Bilateral arm training: same treatment protocol as in group 1, but without a mirror. Day hospital group (6 participants): 17 treatments during 5 weeks for 30 minutes each; inpatient rehabilitation group (10 participants): 37 treatments during 5 weeks for 30 minutes each (a mixture of these are available for the two interventions).

Characteristics

Study-level characteristics

Characteristic	Study (N = 16)
% Female Nominal	10
Mean age (SD) Mean (SD)	73.4 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	16
Haemorrhagic Nominal	0
Time period since stroke (Months) Mean (SD)	9.5 (NR)

Characteristic	Study (N = 16)
Left Nominal	8
Right Nominal	8

Outcomes

Study timepoints

- Baseline
- 5 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 6	Mirror therapy, 5 week, N = 6	Usual care, Baseline, N = 10	Usual care, 5 week, N = 10
Dropout Nominal	NA	0	NA	0

Dropout - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropout-Nominal-Mirror therapy-Usual care-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Saha, 2021

Bibliographic Reference	Saha, S.; Sur, M.; Ray Chaudhuri, G.; Agarwal, S.; Effects of mirror therapy on oedema, pain and functional activities in patients with poststroke shoulder-hand syndrome: A randomized controlled trial; Physiotherapy Research International; 2021; vol. 06; 06

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	An outpatient rehabilitation clinic in Kolkata.
Study dates	No additional information.
Sources of funding	This study was supported by the Institute of Neurosciences Kolkata and Physiomax Organization.
Inclusion criteria	People 1 year after a stroke with middle cerebral artery territory involvement, diagnosed and confirmed by their physician and MRI investigation. People aged between 50 and 70 years with poststroke shoulder-hand syndrome after first-time stroke and could follow the verbal commands.
Exclusion criteria	Any visual impairment causing difficulty in participating in mirror therapy; any orthopaedic or neurological condition that may interfere with recovery of shoulder-hand syndrome, and/or recent myocardial infarction.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=19 Performing all exercises of the stroke rehabilitation program while seated in a chair or stool close to a mirror (55cm x 55cm) positioned vertically between the patient's upper limbs. The unaffected limb was placed in front of the mirror, whereas the affected limb was placed in the opposite side of the mirror, which made it invisible. So, people during exercises observed the mirror image of their unaffected limb as if it were their affected limb. All people were instructed to attempt to perform exercises bilaterally. Concomitant therapy: 4 week stroke rehabilitation program, 30 minutes a day for 5 days a week.
Comparator	Usual care N=19 Performing all exercises of the stroke rehabilitation program, while directly visualising their affected and unaffected limbs. Concomitant therapy: 4 week stroke rehabilitation program, 30 minutes a day for 5 days a week.
Number of participants	38
Duration of follow-up	4 weeks and 6 weeks (end of intervention is 4 weeks, so only this data will be used for analysis).

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear Middle cerebral artery territory. So could be total or partial anterior circulation stroke (dependent on total involvement).
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 19)

Performing all exercises of the stroke rehabilitation program while seated in a chair or stool close to a mirror (55cm x 55cm) positioned vertically between the patient's upper limbs. The unaffected limb was placed in front of the mirror, whereas the affected limb was placed in the opposite side of the mirror, which made it invisible. So, people during exercises observed the mirror image of their unaffected limb as if it were their affected limb. All people were instructed to attempt to perform exercises bilaterally. Concomitant therapy: 4 week stroke rehabilitation program, 30 minutes a day for 5 days a week.

Usual care (N = 19)

Performing all exercises of the stroke rehabilitation program, while directly visualising their affected and unaffected limbs. Concomitant therapy: 4 week stroke rehabilitation program, 30 minutes a day for 5 days a week.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 19)	Usual care (N = 19)
% Female Nominal	5	5
Mean age (SD) Mean (SD)	57.4 (4.91)	59.73 (6.11)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	4	3
Haemorrhagic	11	12

Characteristic	Mirror therapy (N = 19)	Usual care (N = 19)
Nominal		
Time period since stroke (Months) Mean (SD)	13.27 (2.02)	13.47 (1.92)
Right side Nominal	8	7
Left side Nominal	7	8

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 4 week, N = 19	Usual care, Baseline, N = 19	Usual care, 4 week, N = 19
Pain (NRS) Scale range: 0-10. Final value. Mean (SD)	6.07 (1.58)	3.93 (1.39)	6.6 (1.06)	5.33 (0.98)

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 4 week, N = 19	Usual care, Baseline, N = 19	Usual care, 4 week, N = 19
Activities of daily living (functional independence measure) Scale range: 18-126. Final value. Mean (SD)	72.47 (17.41)	88.33 (18.72)	62.88 (15.4)	66.38 (15.33)

Pain (NRS) - Polarity - Lower values are better

Activities of daily living (functional independence measure) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 4 week, N = 19	Usual care, Baseline, N = 19	Usual care, 4 week, N = 19
Dropouts Nominal	NA	3	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Pain(NRS)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Salhab, 2016

Bibliographic Reference	Salhab, Ghadir; Sarraj, Ahmad Rifaii; Saleh, Soha; Mirror therapy combined with functional electrical stimulation for rehabilitation of stroke survivors' ankle dorsiflexion; 2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC); 2016; 4699-4702

Study details

Secondary publication of another included	No additional information.

study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Lebanon.
Study setting	Several centers and hospitals in Lebanon.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Subacute stroke subjects; aged between 40 and 70 years old.
Exclusion criteria	History of visual disorders; history of sensitive disorders; cognitive impairment.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=9 Mirror therapy and electrical stimulation 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of conventional therapy (only the first phase is included in the analysis).
Comparator	Usual care N=9 Conventional therapy 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of mirror therapy and electrical stimulation (only the first phase is included in the analysis).
Number of participants	18.

Duration of follow-up	2 weeks.
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 9)

Mirror therapy and electrical stimulation 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of conventional therapy (only the first phase is included in the analysis).

Usual care (N = 9)

Conventional therapy 2 weeks, 4 times a week, 50 minutes; followed by 2 weeks of mirror therapy and electrical stimulation (only the first phase is included in the analysis).

Characteristics

Study-level characteristics

Characteristic	**Study (N = 18)**
% Female Nominal	8
Mean age (SD) Mean (SD)	58.8 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	13
Haemorrhagic	5

Characteristic	Study (N = 18)
Nominal	
Time period since stroke Nominal	NR
Left Nominal	10
Right Nominal	8

Outcomes

Study timepoints

- Baseline
- 2 week (End of first phase)

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 2 week, N = 9	Usual care, Baseline, N = 9	Usual care, 2 week, N = 9
Dropouts Nominal	NR	0	NR	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Cross-over trial

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Samuelkamaleshkumar, 2014

Bibliographic Reference	Samuelkamaleshkumar, Selvaraj; Reethajanetsureka, Stephen; Pauljebaraj, Paul; Benshamir, Bright; Padankatti, Sanjeev Manasseh; David, Judy Ann; Mirror therapy enhances motor performance in the paretic upper limb after stroke: a pilot randomized controlled trial; Archives of physical medicine and rehabilitation; 2014; vol. 95 (no. 11); 2000-2005

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	India.
Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	Aged between 18 and 60 years, first-time ischaemic or haemorrhagic stroke of the middle cerebral artery tertiary, occurring < 6 months before the start of the study, Brunnstrom recovery stages I to IV for the arm and hand, MMSE > 24.
Exclusion criteria	Not stated.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=10 Mirror therapy: participants performed unilateral movements while watching in the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional mirror therapy a day. Concomitant therapy: Conventional stroke rehabilitation 3 weeks, 5 days a week, 6 hours conventional stroke rehabilitation.
Comparator	Sham therapy N=10 Sham therapy participants performed the same exercises as in MT group using the nonreflecting surface of the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional sham therapy a day. Concomitant therapy: Conventional stroke rehabilitation 3 weeks, 5 days a week, 6 hours conventional stroke rehabilitation.

Number of participants	20.
Duration of follow-up	3 weeks (end of intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 10)

Mirror therapy: participants performed unilateral movements while watching in the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional mirror therapy a day. Concomitant therapy: Conventional stroke rehabilitation 3 weeks, 5 days a week, 6 hours conventional stroke rehabilitation.

Sham therapy (N = 10)

Sham therapy participants performed the same exercises as in MT group using the nonreflecting surface of the mirror 3 weeks, 5 days a week, 2 x 30 minutes additional sham therapy a day. Concomitant therapy: Conventional stroke rehabilitation 3 weeks, 5 days a week, 6 hours conventional stroke rehabilitation.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 10)**	**Sham therapy (N = 10)**
% Female Nominal	2	2
Mean age (SD) (years) Mean (SD)	48.4 (15.58)	53.9 (11.57)
Ethnicity Nominal	NR	NR
Comorbidities	NR	NR

Characteristic	Mirror therapy (N = 10)	Sham therapy (N = 10)
Nominal		
Severity Nominal	NR	NR
Ischaemic Nominal	8	6
Haemorrhagic Nominal	2	4
Time period since stroke (Weeks) Mean (SD)	3.7 (1.1)	4.4 (1.4)
Left Nominal	5	4
Right Nominal	5	6

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 3 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 3 week, N = 10
Upper limb motor function (Box and Block Test) Final value. Mean (SD)	1.1 (3.5)	6.6 (8.4)	0 (0)	0.7 (2.2)
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	9.7 (10)	30.8 (23.9)	4.3 (9.9)	8.8 (13.9)

Upper limb motor function (Box and Block Test) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 10	Mirror therapy, 3 week, N = 10	Sham therapy, Baseline, N = 10	Sham therapy, 3 week, N = 10
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Schick, 2017

Bibliographic Reference	Schick, Thomas; Schlake, Hans-Peter; Kallusky, Juliane; Hohlfeld, Guenter; Steinmetz, Maria; Tripp, Florian; Krakow, Karsten; Pinter, Michaela; Dohle, Christian; Synergy effects of combined multichannel EMG-triggered electrical stimulation and mirror therapy in subacute stroke patients with severe or very severe arm/hand paresis; Restorative neurology and neuroscience; 2017; vol. 35 (no. 3); 319-332

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	German Registry for Clinical Trials: DRKS 00005103.
Study type	Randomised controlled trial (RCT)
Study location	Austria/Germany.
Study setting	3 inpatient rehabilitation centres.
Study dates	September 2013 to August 2014.
Sources of funding	Not stated.
Inclusion criteria	Had suffered their 1st ischaemic or haemorrhagic stroke within 6 months prior to entering the study, had severe (FM-UE i 18 k 33 points) or very severe arm paresis (FM-UE k 17 points) as assessed with the Fugl-Meyer Assessment, had arm/hand function that could be electrically stimulated and EMG-triggered pulses that could be elicited, reported to have

	been independent in their activities of daily living before stroke, reported to have had full functionality of their upper extremities before the stroke, and were able to understand study tasks and test instructions
Exclusion criteria	Were pregnant, had an implanted cardiac pacemaker, defibrillator, brain stimulation, drug pump, or metal implant, had wounds, thrombosis, or phlebitis in the stimulation area; severe forms of Dupuytren's contracture, dementia and concomitant severe neurological diseases; or profound neurocognitive deficits
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Multi-channel EMG-triggered electrostimulation (EMG-MES) + mirror therapy: electrostimulation with a device (4 muscle stimulation channels and up to 2 EMG measurement channels), EMG-triggered pulses for the affected and the unaffected sides were measured and elicited exclusively via the unimpaired side to initiate synchronous bilateral forearm and hand movements (grip and release without objects), standard current frequency was between 30 and 35 Hz, participants were asked to observe the grasping movements of their unaffected limb in the mirror and actively imagine that they were movements of their affected limb 3 weeks, 5 days a week, 30 minutes a day EMG-MES and mirror therapy. Concomitant therapy: Conventional therapy (3 weeks, 5 days a week).
Comparator	Usual care N=17 EMG-MES: same device and protocol (same pulse intensity, same standard current frequency) participants observed directly their grip and release movements on the affected side 3 weeks, 5 days a week, 30 minutes a day EMG-MES. Concomitant therapy: Conventional therapy (3 weeks, 5 days a week).
Number of participants	32.

Duration of follow-up	3 weeks (end of intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Multi-channel EMG-triggered electrostimulation (EMG-MES) + mirror therapy: electrostimulation with a device (4 muscle stimulation channels and up to 2 EMG measurement channels), EMG-triggered pulses for the affected and the unaffected sides were measured and elicited exclusively via the unimpaired side to initiate synchronous bilateral forearm and hand movements (grip and release without objects), standard current frequency was between 30 and 35 Hz, participants were asked to observe the grasping movements

of their unaffected limb in the mirror and actively imagine that they were movements of their affected limb 3 weeks, 5 days a week, 30 minutes a day EMG-MES and mirror therapy. Concomitant therapy: Conventional therapy (3 weeks, 5 days a week).

Usual care (N = 17)

EMG-MES: same device and protocol (same pulse intensity, same standard current frequency) participants observed directly their grip and release movements on the affected side 3 weeks, 5 days a week, 30 minutes a day EMG-MES. Concomitant therapy: Conventional therapy (3 weeks, 5 days a week).

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 15)**	**Usual care (N = 17)**
% Female Nominal	7	6
Mean age (SD) (years) Mean (SD)	62 (19.6)	63 (11.5)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severe Nominal	6	7

Characteristic	Mirror therapy (N = 15)	Usual care (N = 17)
Very severe Nominal	9	10
Ischaemic Nominal	12	15
Haemorrhagic Nominal	3	2
Time period since stroke (days) Mean (SD)	51 (36.4)	49 (32.8)
Left Nominal	8	9
Right Nominal	7	8

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 3 week, N = 15	Usual care, Baseline, N = 17	Usual care, 3 week, N = 17
Upper limb motor function (Box and Block Test) Final value. Mean (SD)	0.9 (2.3)	5.9 (9.2)	1.9 (4.4)	6.3 (9.7)
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	16.67 (10.8)	29.73 (14.4)	16.29 (9)	26.88 (16.7)
Activities of daily living (barthel index) Scale range: 0-100. Final value. Mean (SD)	62.7 (22.3)	75.7 (20.9)	50 (22.3)	64.7 (23.7)

Upper limb motor function (Box and Block Test) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Activities of daily living (barthel index) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 3 week, N = 15	Usual care, Baseline, N = 17	Usual care, 3 week, N = 17
Adverse events Nominal	NR	0	NR	0

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 3 week, N = 15	Usual care, Baseline, N = 17	Usual care, 3 week, N = 17
Dropouts Intervention: 1 did not receive intervention (technical problems with video documentation). Control: 1 discontinued intervention (early discharge from Rehabilitation Center). Nominal	NR	1	NR	1

Adverse events - Polarity - Lower values are better

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(BoxandBlockTest)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Adverseevents-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Seok, 2010

Bibliographic Reference	Seok, Hyun; Kim, Sang Hyun; Jang, Yi Wook; Lee, Jang Bok; Kim, Sun Woo; Effect of Mirror Therapy on Recovery of Upper Limb Function and Strength in Subacute Hemiplegia after Stroke; Journal of the Korean Academy of Rehabilitation Medicine; 2010; vol. 34 (no. 5); 508-512

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	South Korea.
Study setting	Inpatient rehabilitation centre.
Study dates	September 2008 to Feburary 2009.

Sources of funding	Not stated.
Inclusion criteria	Stroke within 6 months.
Exclusion criteria	Not able to understand treatment instructions; communication difficulties due to aphasia; MMSE < 15 points; musculoskeletal or neurological damage of the unaffected upper extremity; modified AS of 3 or more points; Brunnstrom stage of recovery (arm) of 1 or more than 5 points.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=19 Mirror therapy (no additional information). 5 days a week, 30 minutes of therapy for 4 weeks.
Comparator	No treatment N=21 No additional therapy. 5 days a week, 30 minutes of therapy for 4 weeks.
Number of participants	40
Duration of follow-up	4 weeks.
Additional comments	From Cochrane review: Published data only, extracted in part on the basis of an unauthorised, automatic translation of the original publication in Korean.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 19)

Mirror therapy (no additional information). 5 days a week, 30 minutes of therapy for 4 weeks.

No treatment (N = 21)

No additional therapy. 5 days a week, 30 minutes of therapy for 4 weeks.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 40)**
% Female Nominal	22
Mean age (SD) Mean (SD)	51.4 (NR)

Characteristic	Study (N = 40)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke (Months) Mean (SD)	4 (NR)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)

Mirror therapy compared to no treatment at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 19	Mirror therapy, 4 week, N = 19	No treatment, Baseline, N = 21	No treatment, 4 week, N = 21
Upper limb motor function (motor function test) Scale range: Unclear. Final value. Mean (SD)	11.6 (10.6)	17.6 (10.5)	16.7 (8.6)	17.9 (8.9)
Motor impairment (manual muscle test) Scale range: Unclear. Final value. Mean (SD)	24.9 (12.1)	28.2 (11.7)	24.1 (9.6)	26.3 (9.4)

Upper limb motor function (motor function test) - Polarity - Higher values are better

Motor impairment (manual muscle test) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtonotreatmentatendofintervention-continuousoutcome-Upperlimbmotorfunction(motorfunctiontest)-MeanSD-Mirror therapy-No treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtonotreatmentatendofintervention-continuousoutcome-Motorimpairment(manualmuscletest)-MeanSD-Mirror therapy-No treatment-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Simpson, 2019

Bibliographic Reference	Simpson, D.; Ehrensberger, M.; Horgan, F.; Blake, C.; Roberts, D.; Broderick, P.; Monaghan, K.; Unilateral dorsiflexor strengthening with mirror therapy to improve motor function after stroke: A pilot randomized study; Physiotherapy Research International; 2019; vol. 24 (no. 4); e1792

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	ClinicalTrials.gov registry: NCT03497650.
Study location	Ireland.

Study setting	Home-based programme. Clinicians at Sligo University Hospital.
Study dates	January 2015 and March 2016.
Inclusion criteria	Adults presenting with lower limb poststroke hemiparesis, at least 12 months' poststroke (diagnosed by a physician), discharged from formal rehabilitation services and not involved in any other lower limb rehabilitation or strength training during the study.
Exclusion criteria	Cardiovascular, neurological or musculoskeletal impairments not related to stroke that would prevent strength training; impaired cognition (MMSE <24) and vision impairments (identified by the referring clinician) that would interfere with the ability to observe mirror images.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=18 Unilateral strength training with mirror therapy three times a week for 4 weeks. The mirror was placed in the participant's midsagittal plane. The group observed the reflection of the training limb in the mirror. Prompts to focus on the reflection were given to the mirror therapy group only, while other verbal cues were identical for all participants in both groups. The strength training only intervention consisted of a home-based isometric unilateral strength training programme applied to the less affected limb only, and performed under therapist supervision. The warm-up consisted of 1 min of dynamic dorsiflexion contractions at a self-selected speed without resistance, followed by five unilateral submaximal (<50% maximal voluntary contracted) isometric contractions of the less-affected limb. To facilitate an isometric training mode, the participant's less-affected lower limb was strapped into an ankle brace securing the ankle joint at 10 degrees plantarflexion. People were seated with back support, with a knee joint at 120 degrees. Training consisted of four sets of five maximal effort isometric ankle dorsiflexion contractions performed with the less-affected limb only, held for 5s with a 5s rest between repetitions and a 3-min rest between sets. This protocol was followed three times a week for 4 weeks.
Comparator	Usual care N=17 Unilateral strength training only three times a week for 4 weeks.
Number of participants	35.
Duration of follow-up	4 weeks.

Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 18)

Unilateral strength training with mirror therapy three times a week for 4 weeks. The mirror was placed in the participant's midsagittal plane. The group observed the reflection of the training limb in the mirror. Prompts to focus on the reflection were given to the mirror therapy group only, while other verbal cues were identical for all participants in both groups. The strength training only intervention consisted of a home-based isometric unilateral strength training programme applied to the less affected limb only, and performed under therapist supervision. The warm-up consisted of 1 min of dynamic dorsiflexion contractions at a self-selected speed without resistance, followed by five unilateral submaximal (<50% maximal voluntary contracted) isometric contractions of the less-affected limb. To facilitate an isometric training mode, the participant's less-affected lower limb was strapped into an ankle brace securing the

ankle joint at 10 degrees plantarflexion. People were seated with back support, with a knee joint at 120 degrees. Training consisted of four sets of five maximal effort isometric ankle dorsiflexion contractions performed with the less-affected limb only, held for 5s with a 5s rest between repetitions and a 3-min rest between sets. This protocol was followed three times a week for 4 weeks.

Usual care (N = 17)

Unilateral strength training only three times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
% Female Nominal	7	4
Mean age (SD) Mean (SD)	60 (14.7)	63.5 (12)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR

Characteristic	Mirror therapy (N = 18)	Usual care (N = 17)
Ischaemic Nominal	11	9
Haemorrhagic Nominal	5	6
Time period since stroke (Months) Mean (SD)	60 (14.7)	63.5 (12)
Left Nominal	10	7
Right Nominal	6	8

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 4 week, N = 16	Usual care, Baseline, N = 17	Usual care, 4 week, N = 15
Activities of daily living (London Handicap Scale) Scale range: 0-1. Final value. Mean (SD)	0.44 (0.23)	0.53 (0.19)	0.52 (0.23)	0.53 (0.27)

Activities of daily living (London Handicap Scale) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 18	Mirror therapy, 4 week, N = 18	Usual care, Baseline, N =	Usual care, 4 week, N = 17
Dropouts Nominal	NA	2	NA	2

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(LondonHandicapScale)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Sütbeyaz, 2007

Bibliographic Reference	Sütbeyaz, Serap; Yavuzer, Gunes; Sezer, Nebahat; Koseoglu, B Füsun; Mirror therapy enhances lower-extremity motor recovery and motor functioning after stroke: a randomized controlled trial; Archives of physical medicine and rehabilitation; 2007; vol. 88 (no. 5); 555-559

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Turkey.
Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	1st unilateral stroke during previous 12 months; a score of 1 or 2 in the Brunnstrom stages of lower extremity; ambulatory before stroke.
Exclusion criteria	Severe cognitive disorders.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=20 Participants were instructed to move the non-paretic leg while looking in the mirror 5 days a week, 30 minutes of therapy for 4 weeks
Comparator	Sham therapy N=20 Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror to the non-affected leg 5 days a week, 30 minutes of therapy for 4 weeks
Number of participants	40
Duration of follow-up	4 weeks (end of intervention) and after 6 months
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)

Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 20)

Participants were instructed to move the non-paretic leg while looking in the mirror 5 days a week, 30 minutes of therapy for 4 weeks

Sham therapy (N = 20)

Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror to the non-affected leg 5 days a week, 30 minutes of therapy for 4 weeks

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 20)	Sham therapy (N = 20)
% Female Nominal	10	7
Mean age (SD) (years) Mean (SD)	62.7 (9.7)	64.7 (7.7)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	16	17
Haemorrhagic Nominal	4	3
Time period since stroke (Months) Mean (SD)	3.5 (1.3)	3.9 (1.9)

Characteristic	Mirror therapy (N = 20)	Sham therapy (N = 20)
Left Nominal	14	13
Right Nominal	6	7

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)
- 6 month

Mirror therapy compared to sham therapy at end of intervention and >6 months - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Mirror therapy, 6 month, N = 17	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 20	Sham therapy, 6 month, N = 16
Motor impairment (Brunnstrom stages) Scale range: 1-6. Final value. Mean (SD)	2.4 (0.7)	3.5 (0.8)	4.2 (0.8)	2.5 (1)	3 (0.7)	3.4 (0.8)
Activities of daily living (Functional Independence Measure motor) Scale range: 13-91. Final value. This does not include all of the components of activities of	48.3 (5.5)	65.9 (4.8)	69.9 (5.9)	50.2 (11.6)	61.7 (14.6)	62.9 (12.8)

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Mirror therapy, 6 month, N = 17	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 20	Sham therapy, 6 month, N = 16
daily living and so will be downgraded for indirectness. Mean (SD)						

Motor impairment (Brunnstrom stages) - Polarity - Higher values are better

Activities of daily living (Functional Independence Measure motor) - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention and >6 months - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Mirror therapy, 6 month, N = 20	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 20	Sham therapy, 6 month, N = 20
Dropouts Nominal	NA	0	3	NA	0	4

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Motorimpairment(Brunnstromstages)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Motorimpairment(Brunnstromstages)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasuremotor)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the outcome including only a section of the functional independence measure rather than the full outcome)*

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasuremotor)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the outcome including only a section of the functional independence measure rather than the full outcome)*

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Tezuka, 2006

Bibliographic Reference	Tezuka, Y; Fujiwara, M; Kikuchi, K; Ogawa, S; Tokunaga, N; Ichikawa, A; Matsuo, A; Tokuhisa, K; Ota, T; Katsuyama, S; Effect of Mirror Therapy for Patients with Post-Stroke Paralysis of upper limb-randomized Cross-over Study; Journal of Japanese Physical Therapy Association; 2006; vol. 33 (no. 2); 62-68

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT) Cross over trial, first phase was analysed only
Study location	Japan.
Study setting	Inpatient rehabilitation centre.
Study dates	Not stated.
Sources of funding	Not stated.
Inclusion criteria	People admitted or planned to be admitted to rehabilitation ward on the hospital due to post-stroke hemiparesis; within 1 month post-stroke; informed consent was obtained from the participant and their family.

Exclusion criteria	Higher brain dysfunction.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=9 Participants were instructed to move the non-paretic arm while looking in the mirror and passive movement of the paretic arm provided by therapist. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa.
Comparator	Usual care N=6 Passive arm movements: using only passive movements of the affected arm without a mirror. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa.
Number of participants	15
Duration of follow-up	4 weeks (4 weeks for each phase of the study, only 4 weeks [the first phase] are included in the analysis).
Additional comments	From Cochrane review: We only analysed the 1st intervention period of 4 weeks.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 9)

Participants were instructed to move the non-paretic arm while looking in the mirror and passive movement of the paretic arm provided by therapist. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa.

Usual care (N = 6)

Passive arm movements: using only passive movements of the affected arm without a mirror. 10 to 15 minutes a day for 4 weeks, followed by 4 weeks vice versa.

Characteristics

Study-level characteristics

Characteristic	Study (N = 15)
% Female Nominal	9

Characteristic	Study (N = 15)
Mean age (SD) Mean (SD)	63.7 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke (days) Mean (SD)	32.7 (NR)

Outcomes

Study timepoints

- Baseline
- 4 week

Mirror therapy compared to usual care at end of intervention - continuous outcome

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 4 week, N = 9	Usual care, Baseline, N =	Usual care, 4 week, N = 6
Fugl-Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	NR (NR)	11.9 (6.2)	NR (NR)	6.3 (5.2)

Fugl-Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 9	Mirror therapy, 4 week, N = 9	Usual care, Baseline, N = 6	Usual care, 4 week, N = 6
Dropouts Nominal	NA	4	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Cross-over trial

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcome-Fugl-MeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Thieme, 2013

Bibliographic Reference	Thieme, Holm; Bayn, Maria; Wurg, Marco; Zange, Christian; Pohl, Marcus; Behrens, Johann; Mirror therapy for patients with severe arm paresis after stroke–a randomized controlled trial; Clinical rehabilitation; 2013; vol. 27 (no. 4); 314-324

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	German Register of Clinical Studies: DRKS00000732.
Study type	Randomised controlled trial (RCT)

Study location	Germany.
Study setting	Inpatient rehabilitation centre.
Study dates	April 2009 to July 2011.
Sources of funding	Klinik Bavaria Kreischa, Germany.
Inclusion criteria	1st supratentorial stroke within the previous 3 months; aged between 18 and 80 years; clinically diagnosed severe hemiparesis or hemiplegia of the distal upper limb with MRC grading of 0 or 1 of wrist and finger extensors.
Exclusion criteria	Visual impairments that may limit participation in mirror therapy; severe cognitive and/or language deficits which preclude participants from following instructions in the group training protocol; other neurological or musculoskeletal impairments of the upper extremity not due to stroke; severe neglect (head is not turned to the affected side due to instruction)
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=39 Two groups. The first had a group mirror therapy intervention, while the second had mirror therapy as individual treatment. Participants perform movements with both arms (the affected arm as best as could be) while watching the mirror image of the unaffected arm, participants exercised in open groups of 2 to 6 participants. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. Concomitant therapy: Standard rehabilitation programme.
Comparator	Sham therapy N=21 Group intervention; participants exercise in open groups of 2 to 6 participants with the non-reflecting side of the mirror positioned to the unaffected arm. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. Concomitant therapy: Standard rehabilitation programme.

Number of participants	60
Duration of follow-up	5 weeks (end of intervention) and 7 months after treatment (no outcomes reported at 7 months).
Additional comments	Published and unpublished data.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 39)

Two groups. The first had a group mirror therapy intervention, while the second had mirror therapy as individual treatment. Participants perform movements with both arms (the affected arm as best as could be) while watching the mirror image of the unaffected arm,

participants exercised in open groups of 2 to 6 participants. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. Concomitant therapy: Standard rehabilitation programme.

Sham therapy (N = 21)

Group intervention; participants exercise in open groups of 2 to 6 participants with the non-reflecting side of the mirror positioned to the unaffected arm. All therapy was for 5 weeks, additional 20 sessions, 30 minutes mirror therapy. Concomitant therapy: Standard rehabilitation programme.

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 39)**	**Sham therapy (N = 21)**
% Female Nominal	18	7
Mean age (SD) (years) Mean (SD)	66.7 (11.4)	68.3 (8.9)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR

Characteristic	Mirror therapy (N = 39)	Sham therapy (N = 21)
Ischaemic Nominal	29	15
Haemorrhagic Nominal	9	6
Time period since stroke (days) Mean (SD)	41.5 (24.1)	51.4 (22.5)
Left Nominal	12	*empty data*
Right Nominal	25	11

Outcomes

Study timepoints

- Baseline
- 5 week (End of intervention)

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 39	Mirror therapy, 5 week, N = 39	Sham therapy, Baseline, N = 21	Sham therapy, 5 week, N = 21
Upper limb motor function (Arm Action Research Test) Scale range: 0-57. Final value. Mean (SD)	1 (3.4)	3.1 (8.9)	0.3 (0.9)	3.1 (7.1)
Fugl Meyer Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	4.3 (7)	8.5 (11.3)	4.1 (4.6)	9.2 (10.6)
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	44.8 (14.9)	57 (16.6)	47.5 (15)	62.5 (22.8)
Pain (Fugl Meyer Assessment Pain) Scale range: Unclear. Final value. Mean (SD)	18.9 (4.2)	19.6 (4.3)	20.4 (3.6)	18.1 (4.5)
Visuospatial neglect (Star Cancellation Test) (Number of small stars circled.) Scale range: 0-51. Mean (SD)	32 (10)	44.8 (11)	42 (5.1)	39.7 (8.8)
Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) Scale range: 0-100. Final value. Mean (SD)	47.5 (12.1)	55.8 (11.4)	49.9 (11.4)	57.2 (17)

Upper limb motor function (Arm Action Research Test) - Polarity - Higher values are better

Fugl Meyer Upper Extremity Motor - Polarity - Higher values are better

Activities of daily living (barthel index) - Polarity - Higher values are better

Pain (Fugl Meyer Assessment Pain) - Polarity - Higher values are better

Visuospatial neglect (Star Cancellation Test) - Polarity - Higher values are better

Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) - Polarity - Lower values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 39	Mirror therapy, 5 week, N = 39	Sham therapy, Baseline, N = 21	Sham therapy, 5 week, N = 21
Dropouts Nominal	NA	8	NA	3

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Upperlimbmotorfunction(ArmActionResearchTest)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Motorimpairment(FuglMeyerUpperExtremityMotor)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Pain(FuglMeyerAssessmentPain)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Visuospatialneglect(StarCancellationTest)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-MeanSD-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Sham therapy-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Tyson, 2015

Bibliographic Reference	Tyson, Sarah; Wilkinson, Jack; Thomas, Nessa; Selles, Ruud; McCabe, Candy; Tyrrell, Pippa; Vail, Andy; Phase II pragmatic randomized controlled trial of patient-led therapies (mirror therapy and lower-limb exercises) during inpatient stroke rehabilitation; Neurorehabilitation and neural repair; 2015; vol. 29 (no. 9); 818-826

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom.
Study setting	12 inpatient stroke services.
Study dates	Not stated.
Sources of funding	National Institute for Health Research under its Research for Patient Benefit (RfPB) Programme
Inclusion criteria	Stroke at least 1 week previously and inpatient in a stroke rehabilitation unit, no premorbid conditions limiting upper or lower limb function, sufficient cognitive and communication to give consent, medically stable and able to participate in rehabilitation, upper or lower limb weakness which limits activity.
Exclusion criteria	Not stated.

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=63 Participants were taught how to do the mirror therapy and given an (aphasia-friendly) instruction booklet to show them how to position the mirror themselves and also the exercises to do. An allocated member of staff checked on them daily to remind them to do the therapy and complete their diary sheets, help them get set up (if necessary), deal with any problems and progress the exercises. For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy. Concomitant therapy: Conventional rehabilitation programme.
Comparator	Usual care N=31 Lower limb exercises (without a mirror). For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy. Concomitant therapy: Conventional rehabilitation programme.
Number of participants	94
Duration of follow-up	8 weeks (intervention for 4 weeks, follow up is available for this time and so is included for the outcome).
Additional comments	Published and unpublished data, full-text publication received in 2016.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Unsupervised

	Patient led
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 63)

Participants were taught how to do the mirror therapy and given an (aphasia-friendly) instruction booklet to show them how to position the mirror themselves and also the exercises to do. An allocated member of staff checked on them daily to remind them to do the therapy and complete their diary sheets, help them get set up (if necessary), deal with any problems and progress the exercises. For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy. Concomitant therapy: Conventional rehabilitation programme.

Usual care (N = 31)

Lower limb exercises (without a mirror). For 4 weeks, 7 days a week, 30 minutes a day of mirror therapy. Concomitant therapy: Conventional rehabilitation programme.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 63)	Usual care (N = 31)
% Female Nominal	25	8
Mean age (SD) Mean (SD)	64 (15)	64 (13)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke (days) Range	7 to 76	7 to 113
Time period since stroke (days) Median (IQR)	18 (NA to NA)	29 (NA to NA)

Characteristic	Mirror therapy (N = 63)	Usual care (N = 31)
Right Nominal	27	11

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 63	Mirror therapy, 4 week, N = 57	Usual care, Baseline, N = 31	Usual care, 4 week, N = 28
Upper limb motor function (scale unclear, ?Arm Action Research Test) Scale range: unclear. Final value. The paper reports change scores, but the numbers from the Cochrane review are final values and will be used. Mean (SD)	13 (18)	20 (23)	10 (15)	17 (21)
Motor impairment (scale unclear, Morticity index? Scale range: unclear. Final value. The paper reports change scores, but the numbers from the Cochrane review are final values and will be used. Mean (SD)	40 (32)	49 (32)	39 (29)	47 (28)

Outcome	Mirror therapy, Baseline, N = 63	Mirror therapy, 4 week, N = 57	Usual care, Baseline, N = 31	Usual care, 4 week, N = 28
Visuospatial neglect (Star Cancellation) (number of small stars crossed out) Scale range: 0-54 Mean (SD)	47 (15)	50 (11)	48 (12)	50 (11)

Upper limb motor function (scale unclear, ?Arm Action Research Test) - Polarity - Higher values are better

Motor impairment (scale unclear, Morticity index? - Polarity - Higher values are better

Visuospatial neglect (Star Cancellation) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 63	Mirror therapy, 4 week, N = 63	Usual care, Baseline, N = 31	Usual care, 4 week, N = 31
Dropouts Mirror therapy: 1 did not receive allocated intervention, 3 withdrew during intervention, 2 not available at 4 week assessment. Usual care: 1 withdrew during intervention, 2 not available at 4 week assessment. Nominal	NA	6	NA	3

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(scaleunclear,?ArmActionResearchTest)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorimpairment(scaleunclear,Morticityindex?-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Visuospatialneglect(StarCancellation)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Vural, 2016

Bibliographic Reference	Vural, Sp; Yuzer, Gf; Ozcan, Ds; Ozbudak, Sd; Ozgirgin, N; Effects of mirror therapy in stroke patients with complex regional pain syndrome type 1: A randomized controlled study; Archives of Physical Medicine and Rehabilitation; 2016; vol. 97 (no. 4); 575-81.

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)

Study location	Turkey.
Study setting	Inpatient rehabilitation center.
Study dates	November 2011 and September 2012.
Sources of funding	No additional information.
Inclusion criteria	First episode of hemiplegia after stroke diagnosed by a neurologist within 12 months; presence of concomitant dystrophic (intermediate) stage of CRPS type 1; the Mini-Mental State Examination score >23.
Exclusion criteria	Unstable medical status; visual impairment; shoulder subluxation; history of an injection to the shoulder in the last 6 months; presence of neglect; presence of another reason for upper limb pain; presence of concomitant progressive central nervous system disorder; history of hand dysfunction in the affected side.
Recruitment / selection of participants	People evaluated in their inpatient rehabilitation center. People diagnosed with chronic regional pain syndrome type 1 according to the Veldman criteria.
Intervention(s)	Mirror therapy N=15 Mirror therapy where the person is seated on a chair close to a table with a mirror (35x35cm) positioned vertically between the patient's upper limbs. The unaffected arm was placed in front of the mirror, whereas the affected arm was placed in a suitable box, which made it invisible. People were trained to perform various movements in the unaffected side: flexion and extension of the elbow, wrist, and fingers; supination and pronation of the forearm; and abduction, adduction and opposition of the fingers. The patients were asked to look in the mirror constantly during the exercise and imagine that the reflection belonged to the affected side. In addition, patients were told to try to do the same movements with the unaffected side. All sessions were performed by the same practitioner for all of the patients. Additional mirror therapy for 30 minutes/day. Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day.
Comparator	Usual care N=15 Conventional programme consisting of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required). Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day.
Number of participants	30
Duration of follow-up	4 weeks (end of intervention).

Additional comments	Reports outcomes as median/range. Therefore, we are not able to include these in our analysis.
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Mirror therapy where the person is seated on a chair close to a table with a mirror (35x35cm) positioned vertically between the patient's upper limbs. The unaffected arm was placed in front of the mirror, whereas the affected arm was placed in a suitable box, which made it invisible. People were trained to perform various movements in the unaffected side: flexion and extension of the elbow, wrist, and fingers; supination and pronation of the forearm; and abduction, adduction and opposition of the fingers. The patients were asked to look in the mirror constantly during the exercise and imagine that the reflection belonged to the affected side. In addition, patients were told to try to do the same movements with the unaffected side. All sessions were performed by the same practitioner for

all of the patients. Additional mirror therapy for 30 minutes/day. Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day.

Usual care (N = 15)

Conventional programme consisting of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required). Conventional stroke rehabilitation for 4 weeks, 5 days/week for 2-4 hours per day.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 15)	Usual care (N = 15)
% Female Nominal	7	6
Mean age (SD) Mean (SD)	68.9 (10.5)	61.4 (11.9)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR

Characteristic	Mirror therapy (N = 15)	Usual care (N = 15)
Ischaemic Nominal	11	12
Haemorrhagic Nominal	4	3
Time period since stroke Median (IQR)	120 (60 to 210)	180 (65 to 240)
Left Nominal	7	7
Right Nominal	8	8

Outcomes

Study timepoints

- Baseline
- 4 week

Mirror therapy compared to usual care at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 15	Mirror therapy, 4 week, N = 15	Usual care, Baseline, N = 15	Usual care, 4 week, N = 15
Dropout Nominal	NA	0	NA	0

Dropout - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcome-Dropout-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Wang, 2017

Bibliographic Reference	Wang, H.; Zhao, Z.; Jiang, P.; Li, X.; Lin, Q.; Wu, Q.; Effect and mechanism of mirror therapy on rehabilitation of lower limb motor function in patients with stroke hemiplegia; Biomedical Research (India); 2017; vol. 28 (no. 22); 10165-10170

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	China
Study setting	rehabilitation unit
Study dates	September 1, 2013 to December 26, 2013
Sources of funding	NR
Inclusion criteria	Diagnosed, by brain CT or MRI with the diagnostic criteria for stroke developed by WHO in 1989, to suffer the first occurrence of unilateral cortical or subcortical function impairment blood-supplying region of middle cerebral artery. The patients with the duration of less than 2 months and with no rehabilitation therapy. Patients aged younger than 70. Patients with hemilateral dyskinesia at the Brunnstrom staging of I-IV in motor function of hemiplegic lower limb; the patients with the stable vital signs and a GCS score of 15. Patients with more than 48 h of aggravated nervous system symptoms without any progression. Patients with the education level of junior or above as well as a MMSE score of 24 and with no cognitive dysfunction. Patients with the function of the sitting balance ranking the 3rd level, the patients with normal result of KVIQ test.
Exclusion criteria	Stroke patients complicated with severe affective disorders, sensory aphasia, mixed aphasia, apraxia, unilateral neglect, unilateral sensory impairment or serious limb spasm (improved Ashworth grading>grade 1). Patients with history of cerebral stroke, brain trauma, brain tumors or other nervous system diseases. Patients with a history of mental illness. Patients with serious dysfunction of important organs like heart, lung, liver and kidney; the patients with the history of malignancy. Patients with serious injury or disease in the lower extremity bone, joint or peripheral nerve. Patients with deep venous

	thrombus of lower extremity. Patients with the failure of visual impairment correction. Patients with MRI contraindication such as fear of metal implanted material and phobia.
Recruitment / selection of participants	From September 1, 2013 to December 26, 2013, 36 cases of stroke patients with hemiplegia treated in Department of rehabilitation of Qinhuangdao First Hospital of Hebei Province were selected as the objects based on the above criteria of inclusion and exclusion.
Intervention(s)	Both groups received conventional rehabilitation treatment, including the therapy of normal limb position put and lower limb-facilitation technique, training of balance function, gait and activities of daily living, training of play instruments like power bicycle and other physical factors treatment, 2-3 h/d, 5 d/w. Mirror therapy group was treated with assisted mirror therapy, 40 min/d, 5 d/w. Patients were guided to take the long seat or sitting position in front of a mirror (size of 45 × 70 cm) which was perpendicularly placed along median sagittal plane. The patient symmetrically placed both lower limbs on both sides of the mirror where the lower extremity of the uninjured side can reflect the side of the reflecting surface of the limb; the upper part of the body lightly inclined toward the healthy side to observe imaging of the lower limb of the uninjured side on the mirror surface and the affected lower limb, blocked by the mirror, failed to enter the field of vision. The patients were told to try to make lower limbs do the same action and complete the action with the help of therapist if necessary. Type of task: taking simple movement of the lower extremity joints including 5 groups of actions, each action lasting 5 min, with Range of Motion (ROM) of joints as large as possible including flexion and extension of hip joint, internal and external rotation of hip, flexion and extension of knee joint, dorsiflexion as well as plantar flexion and circumduction of ankle joint.
Comparator	Both groups received conventional rehabilitation treatment, including the therapy of normal limb position put and lower limb-facilitation technique, training of balance function, gait and activities of daily living, training of play instruments like power bicycle and other physical factors treatment, 2-3 h/d, 5 d/w. The routine rehabilitation group additionally included the passive or active supplementary training of the lower extremities of the affected side with the same training as the mirror therapy with the avoidance of visual feedback or motor imagery of the lower limbs in this course, 40 min/d, 5 d/w
Number of participants	36
Duration of follow-up	6 weeks
Additional comments	

Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity

Study arms

mirror therapy (N = 18)

general rehabilitation (N = 18)

Characteristics

Study-level characteristics

Characteristic	Study (N = 36)
% Female Nominal	10
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke ischaemic Nominal	NR
Time period since stroke Nominal	NR

Arm-level characteristics

Characteristic	mirror therapy (N = 18)	general rehabilitation (N = 18)
Mean age (SD)	52.45 (2.91)	53 (2.79)

Characteristic	mirror therapy (N = 18)	general rehabilitation (N = 18)
Mean (SD)		
side of paresis (left) Nominal	10	9

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	mirror therapy, Baseline, N = 18	mirror therapy, 6 week, N = 18	general rehabilitation, Baseline, N = 18	general rehabilitation, 6 week, N = 18
motor impairment (Brunnstrom Stages of the Lower Extremity) 1-7 Mean (SD)	2.5 (1.1)	4.44 (1.34)	2.61 (1.14)	3.67 (1.28)
Activities of daily living (Functional Independence Measure - walking) Mean (SD)	11.22 (6.34)	20.67 (6.97)	10.89 (6.41)	16.17 (6.07)

motor impairment (Brunnstrom Stages of the Lower Extremity) - Polarity - Higher values are better

Activities of daily living (Functional Independence Measure - walking) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

6weekoutcomes-motorimpairment(BrunnstromStagesoftheLowerExtremity)-MeanSD-mirror therapy-general rehabilitation-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

6weekoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasure-walking)-MeanSD-mirror therapy-general rehabilitation-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Wang, 2015

Bibliographic Reference	Wang, Liju; Chen, Lizao; Yi, OU; Guo, Long; Hao, Dan; Chen, Sisi; Song, Ping; Wanling, HU; Effects of mirror visual feedback and electromyographic biofeedback on upper extremity function in hemiplegics after stroke; Chinese Journal of Rehabilitation Theory and Practice; 2015; vol. 22 (no. 2); 202-206

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	Not stated.
Study dates	March 2012 to June 2014.
Sources of funding	Changsha Economics Office.
Inclusion criteria	1st ischaemic or haemorrhagic stroke (CT or MRI); neurological deficit; aged 30 to 75 years; unilateral paralysis of upper limb; stable vital signs; mental health; normal intelligence; no significant cognitive dysfunction; MMSE > 24; middle school education and above; no visual impairment; no aphasia and dementia; can execute instructions
Exclusion criteria	Unstable condition; severe disease or infection of heart; liver or kidney; other complicated diseases which could affect motor function
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=30

	Additional mirror therapy upper extremity for 8 weeks, 6 days a week, 30 minutes of additional mirror therapy. Concomitant therapy: routine rehabilitation and task-oriented training for 8 weeks, 6 days a week, 60 minutes of routine rehabilitation.
Comparator	Usual care N=60 Two groups. One received additional electromyographic biofeedback 8 weeks, 6 days a week, 20 minutes additional EMGBF. One did not include any additional therapy. Concomitant therapy: routine rehabilitation and task-oriented training for 8 weeks, 6 days a week, 60 minutes of routine rehabilitation.
Number of participants	90
Duration of follow-up	8 weeks.
Additional comments	From the Cochrane review: Information based on abstract; extracted in part on the basis of an unauthorised, automatic translation of the original publication in Chinese
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 30)

Additional mirror therapy upper extremity for 8 weeks, 6 days a week, 30 minutes of additional mirror therapy. Concomitant therapy: routine rehabilitation and task-oriented training for 8 weeks, 6 days a week, 60 minutes of routine rehabilitation.

Usual care (N = 60)

Two groups. One received additional electromyographic biofeedback 8 weeks, 6 days a week, 20 minutes additional EMGBF. One did not include any additional therapy. Concomitant therapy: routine rehabilitation and task-oriented training for 8 weeks, 6 days a week, 60 minutes of routine rehabilitation.

Characteristics

Study-level characteristics

Characteristic	Study (N = 90)
% Female Nominal	40

Characteristic	Study (N = 90)
Mean age (SD) (years (SD)) Mean (SD)	64.9 (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Ischaemic Nominal	57
Haemorrhagic Nominal	33
Time period since stroke (days) Mean (SD)	63.7 (NR)
Left Nominal	39
Right Nominal	51

Outcomes

Study timepoints

- Baseline
- 8 week (End of intervention)

Mirror therapy compared to usual care at end of intervention and 6 months - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 30	Mirror therapy, 8 week, N = 30	Usual care, Baseline, N = 60	Usual care, 8 week, N =
Upper limb motor function (Upper Extremity Function Test). Scale range: Unclear. Final value. Mean (SD)	NR (NR)	73.5 (7.2)	NR (NR)	63 (11.9)
Fugl Meyer Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	NR (NR)	41.1 (7.2)	NR (NR)	31.5 (6.7)

Upper limb motor function (Upper Extremity Function Test). - Polarity - Higher values are better

Fugl Meyer Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention and 6 months - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 30	Mirror therapy, 8 week, N = 30	Usual care, Baseline, N = 60	Usual care, 8 week, N = 60
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofinterventionand6months-continuousoutcomes-Upperlimbmotorfunction(UpperExtremityFunctionTest).-MeanSD-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand6months-continuousoutcomes-FuglMeyerUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand6months-dichotomousoutcome-Dropouts-Nominal-Mirror therapy-Usual care-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Wu, 2013

Bibliographic Reference	Wu, Ching-Yi; Huang, Pai-Chuan; Chen, Yu-Ting; Lin, Keh-Chung; Yang, Hsiu-Wen; Effects of mirror therapy on motor and sensory recovery in chronic stroke: a randomized controlled trial; Archives of physical medicine and rehabilitation; 2013; vol. 94 (no. 6); 1023-1030

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Taiwan.
Study setting	4 hospitals.
Study dates	Not stated.

Sources of funding	Not stated.
Inclusion criteria	1st unilateral ischaemic or haemorrhagic cerebrovascular accident before > 6 months, mild to moderate motor impairment (FM-UE 26-56), mild spasticity (mAS < 3), able to understand and follow the instructions (MMSE > 24);
Exclusion criteria	Participation in another study or experimental rehabilitation project < 6 months, serious visual or visual perception impairment (e.g. neglect and poor visual fields) assessed by NIHSS, severe neuropsychologic, neuromuscular or orthopaedic disease
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=16 Participants were instructed to observe their unaffected upper limb in mirror box while performing bilateral movements for 4 weeks, 5 days a week, 60 minutes a day of MT, followed by 30 minutes task-oriented training.
Comparator	Usual care N=17 Usual occupational therapy, task-oriented training: co-ordination, unilateral and bilateral fine-motor tasks, static and dynamic standing and sitting, balance, compensatory practice on functional tasks 4 weeks, 5 days a week, 90 minutes a day.
Number of participants	33
Duration of follow-up	4 weeks (end of intervention) and 6 months
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Chronic stroke (>6 months)
Subgroup 2: Level of supervision	Supervised

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity

Study arms

Mirror therapy (N = 16)

Participants were instructed to observe their unaffected upper limb in mirror box while performing bilateral movements for 4 weeks, 5 days a week, 60 minutes a day of MT, followed by 30 minutes task-oriented training.

Usual care (N = 17)

Usual occupational therapy, task-oriented training: co-ordination, unilateral and bilateral fine-motor tasks, static and dynamic standing and sitting, balance, compensatory practice on functional tasks 4 weeks, 5 days a week, 90 minutes a day.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 16)	Usual care (N = 17)
% Female Nominal	5	5
Mean age (SD) (years) Mean (SD)	54.77 (11.66)	53.59 (10.21)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Mean (SD)	1.2 (1.15)	1.53 (1.55)
Haemorrhagic Nominal	6	7
Ischaemic Nominal	10	10
Time period since stroke (Months) Mean (SD)	54.77 (11.66)	53.59 (10.21)

Characteristic	Mirror therapy (N = 16)	Usual care (N = 17)
Right Nominal	8	10
Left Nominal	8	7

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)
- 6 month

Mirror therapy compared to usual care at end of intervention and >6 months - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 4 week, N = 16	Mirror therapy, 6 month, N = 16	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17	Usual care, 6 month, N = 17
Fugl-Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	45.94 (8.91)	51.25 (8.14)	NR (NR)	44.41 (10.69)	47.88 (9.85)	NR (NR)
Activities of daily living (modified activities of daily living) Scale range: 0-5. Final value.	1.22 (1.07)	1.49 (1.08)	1.83 (1.29)	1.18 (1.28)	1.62 (1.36)	1.62 (1.19)

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 4 week, N = 16	Mirror therapy, 6 month, N = 16	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17	Usual care, 6 month, N = 17
Extracted from Amount of Use subscale. Mean (SD)						

Fugl-Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Activities of daily living (modified activities of daily living) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention and >6 months - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 16	Mirror therapy, 4 week, N = 16	Mirror therapy, 6 month, N = 16	Usual care, Baseline, N = 17	Usual care, 4 week, N = 17	Usual care, 6 month, N = 17
Dropouts Nominal	NA	0	5	NA	0	7

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofinterventionand>6months-continuousoutcomes-Fugl-MeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(modifiedactivitiesofdailyliving)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(modifiedactivitiesofdailyliving)-MeanSD-Mirror therapy-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand>6months-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofinterventionand>6months-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Xu, 2017

Bibliographic Reference	Xu, Q.; Guo, F.; Salem, H. M. A.; Chen, H.; Huang, X.; Effects of mirror therapy combined with neuromuscular electrical stimulation on motor recovery of lower limbs and walking ability of patients with stroke: a randomized controlled study; Clinical Rehabilitation; 2017; vol. 31 (no. 12); 1583-1591

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.

Trial name / registration number	Chinese Clinical Trial Registry, ID number ChiCTR-INR-16009807.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	An inpatient rehabilitation centre of Tongji Hospital.
Study dates	No additional information.
Sources of funding	The author(s) received no financial support for the research, authorship and/or publication of this article.
Inclusion criteria	First episode of unilateral stroke with hemiparesis; more than one month after stroke onset; the Modified Ashworth Scale for plantar flexor spasticity is higher than 1 and lower than 4; the Functional Ambulation Categories score is between 3 and 5 (inclusive); the ability to understand and follow simple verbal instructions.
Exclusion criteria	Any preexisting neurological disorders other than stroke; any psychological or medical condition that would affect the patient's ability to comply with the study protocol; impaired vision or aphasia; fixed contracture of the ankle or foot.
Recruitment / selection of participants	People with foot drop after stroke were recruited from the Inpatient Rehabilitation Center of Tongji Hospital. All people were diagnosed with stroke, as confirmed using computed tomography or magnetic resonance imaging.
Intervention(s)	Mirror therapy N=46 Two groups: 1) Mirror therapy only. 2) Mirror therapy and neuromuscular electrical stimulation. Mirror therapy received 30 minutes of mirror therapy training. People were in a sitting position with a mirror (60x90cm) positioned between their legs and perpendicular to their midline. The reflecting side of the mirror was adjusted to show the unaffected leg. A therapist reminded the patients to flex and extend the ankle, at the same time observe the reflection of the unaffected leg in the mirror. Neuromuscular electrical stimulation was delivered by electrodes measuring 5cm x 5cm; one electrode was placed over the common peroneal nerve and the other electrode was positioned on the midpoint of the anterior tibialis muscle of the affected leg. The frequency was 50Hz and the intensity was 10mA (or was sufficient to elicit the dorsiflexion and eversions of the affected ankle). The duration of stimulation and rest were 5 seconds separately. The current application was synchronized with active exercises, following the indications given by the therapist. On examination of the ankle dorsiflexion of the affected leg induced by neuromuscular electrical stimulation, the therapist reminded the patients to dorsiflex the unaffected ankle and to observe the movement in the mirror. Therapy was for 0.5 hours/day and five days/week for 4 weeks.

Comparator	Usual care N=23 4 weeks conventional rehabilitation therapy. They performed the same training for the same duration; however, the nonreflecting side of the3 mirror was used. The therapists also reminded the patient to move their leg as in the mirror group. Therapy was for 0.5 hours/day and five days/week for 4 weeks.
Number of participants	69
Duration of follow-up	4 weeks
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Lower extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 46)

Two groups: 1) Mirror therapy only. 2) Mirror therapy and neuromuscular electrical stimulation. Mirror therapy received 30 minutes of mirror therapy training. People were in a sitting position with a mirror (60x90cm) positioned between their legs and perpendicular to their midline. The reflecting side of the mirror was adjusted to show the unaffected leg. A therapist reminded the patients to flex and extend the ankle, at the same time observe the reflection of the unaffected leg in the mirror. Neuromuscular electrical stimulation was delivered by electrodes measuring 5cm x 5cm; one electrode was placed over the common peroneal nerve and the other electrode was positioned on the midpoint of the anterior tibialis muscle of the affected leg. The frequency was 50Hz and the intensity was 10mA (or was sufficient to elicit the dorsiflexion and eversions of the affected ankle). The duration of stimulation and rest were 5 seconds separately. The current application was synchronized with active exercises, following the indications given by the therapist. On examination of the ankle dorsiflexion of the affected leg induced by neuromuscular electrical stimulation, the therapist reminded the patients to dorsiflex the unaffected ankle and to observe the movement in the mirror. Therapy was for 0.5 hours/day and five days/week for 4 weeks.

Usual care (N = 23)

4 weeks conventional rehabilitation therapy. They performed the same training for the same duration; however, the nonreflecting side of the3 mirror was used. The therapists also reminded the patient to move their leg as in the mirror group. Therapy was for 0.5 hours/day and five days/week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 46)	Usual care (N = 23)
% Female Nominal	14	8

Characteristic	Mirror therapy (N = 46)	Usual care (N = 23)
Mean age (SD) Mean (SD)	54.35 (10.05)	56.09 (8.12)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	34	17
Haemorrhagic Nominal	12	6
Time period since stroke (days) Mean (SD)	43.01 (5.81)	45.78 (6.5)
Left Nominal	15	10
Right Nominal	31	13

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 46	Mirror therapy, 4 week, N = 46	Usual care, Baseline, N = 23	Usual care, 4 week, N = 23
Motor impairment (Brunnstrom stage of motor recovery of the lower limb) Scale range: 1-7. Final value. Mean (SD)	2.29 (0.51)	3.5 (0.55)	2.35 (0.57)	2.83 (0.65)

Motor impairment (Brunnstrom stage of motor recovery of the lower limb) - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 46	Mirror therapy, 4 week, N = 46	Usual care, Baseline, N = 23	Usual care, 4 week, N = 23
Dropouts Nominal	0	0	0	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorimpairment(Brunnstromstageofmotorrecoveryofthelowerlimb)-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Yavuzer, 2008

Bibliographic Reference	Yavuzer, Gunes; Selles, Ruud; Sezer, Nebahat; Sütbeyaz, Serap; Bussmann, Johannes B; Köseoğlu, Füsun; Atay, Mesut B; Stam, Henk J; Mirror therapy improves hand function in subacute stroke: a randomized controlled trial; Archives of physical medicine and rehabilitation; 2008; vol. 89 (no. 3); 393-398

Study details

Secondary publication of another included	No additional information.

study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Turkey.
Study setting	Inpatient rehabilitation centre.
Study dates	February 2006 to April 2006.
Sources of funding	Not stated.
Inclusion criteria	1st unilateral stroke during previous 12 months; a Brunnstrom recovery stage between 1 and 4 of the upper extremity; able to understand and follow simple instructions.
Exclusion criteria	Severe cognitive disorders (MMSE < 24).
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=20 Participants were instructed to move both arms while looking in the mirror. 5 days a week, 30 minutes of therapy for 4 weeks.
Comparator	Sham therapy N=20 Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror. 5 days a week, 30 minutes of therapy for 4 weeks.

Number of participants	40
Duration of follow-up	4 weeks (end of intervention) and 6 months.
Additional comments	The Cochrane review combined the Brunnstrom stages of upper extremity and hand into 1 item using raw data.
Subgroup 1: Acute/subacute or chronic stroke	Mixed
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 20)

Participants were instructed to move both arms while looking in the mirror. 5 days a week, 30 minutes of therapy for 4 weeks.

Sham therapy (N = 20)

Participants performed the same treatment protocol as in group 1 but with the nonreflecting side of the mirror. 5 days a week, 30 minutes of therapy for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 20)	Sham therapy (N = 20)
% Female Nominal	8	9
Mean age (SD) (years) Mean (SD)	63.2 (9.2)	63.3 (9.5)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Ischaemic Nominal	14	15
Haemorrhagic	3	4

Characteristic	Mirror therapy (N = 20)	Sham therapy (N = 20)
Nominal		
Time period since stroke (Months) Range	3 to 12	3 to 12
Time period since stroke (Months) Mean (SD)	5.4 (2.9)	5.5 (2.5)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)
- 6 month

Mirror therapy compared to sham therapy at end of intervention and >6 months - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 17	Mirror therapy, 6 month, N = 17	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 19	Sham therapy, 6 month, N = 19
Motor function (Brunnstrom stage hand and upper extremity) Scale range: 0-6. Final value. Mean (SD)	NR (NR)	3.6 (1.2)	4.2 (1.3)	NR (NR)	2.8 (1)	3.1 (1.1)
Activities of daily living (functional independence	23.7 (7)	28.9 (10)	32 (9.5)	21.1 (5)	22.2 (6.3)	22.9 (6.3)

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 17	Mirror therapy, 6 month, N = 17	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 19	Sham therapy, 6 month, N = 19
measure self-care items) Scale range: 6-42. Final value. Mean (SD)						

Motor function (Brunnstrom stage hand and upper extremity) - Polarity - Higher values are better

Activities of daily living (functional independence measure self-care items) - Polarity - Higher values are better

Mirror therapy compared to sham therapy at end of intervention and >6 months - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 20	Mirror therapy, 4 week, N = 20	Mirror therapy, 6 month, N = 20	Sham therapy, Baseline, N = 20	Sham therapy, 4 week, N = 20	Sham therapy, 6 month, N = 20
Dropouts Nominal	0	3	3	0	1	1

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Motorfunction(Brunnstromstagehandandupperextremity)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Motorfunction(Brunnstromstagehandandupperextremity)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasureself-careitems)-MeanSD-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasureself-careitems)-MeanSD-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofinterventionand>6months-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Sham therapy-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Yoon, 2014

Bibliographic Reference	Yoon, Jin A; Koo, Bon Il; Shin, Myung Jun; Shin, Yong Beom; Ko, Hyun-Yoon; Shin, Yong-Il; Effect of constraint-induced movement therapy and mirror therapy for patients with subacute stroke; Annals of rehabilitation medicine; 2014; vol. 38 (no. 4); 458

Study details

Secondary publication of	No additional information.

another included study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatient rehabilitation centre.
Study dates	October 2012 to May 2013.
Sources of funding	2-year research grant of Pusan National University, Republik of Korea.
Inclusion criteria	Hemiplegia due to stroke < 6 weeks after onset, no past history of stroke, able to perform an active extension of the affected wrist and more than 2 fingers at an angle of > 10 ° and an active abduction of the affected thumb at an angle of > 10 °, capable of simple communication, can receive care by guardians or caregivers, able to maintain a sitting position for > 30 minutes
Exclusion criteria	People with depression who were unable to co-operate in the treatment, not able to perform active task training due to musculoskeletal problems, spasticity of mAS II or higher, complex regional pain syndrome or secondary adhesive capsulitis
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=8 Additional constraint induced movement therapy and mirror therapy for an additional 2 hours, 3 times a day CIMT and 30 minutes MT a day.

	Concomitant therapy: Conventional therapy 2 weeks, 5 days a weeks, with 40 minutes a day of conventional therapy
Comparator	Usual care N=9 Two groups. The first (n=9) have additional constraint induced movement therapy and self-exercise for an additional 2 hours, 3 times a day CIMT and 30 minutes self-exercise a day. The second group (n=9) received additional self-exercise for an additional 30 minutes, 2 times a day of self-exercise. The second group was not included in the analysis. Concomitant therapy: Conventional therapy 2 weeks, 5 days a weeks, with 40 minutes a day of conventional therapy
Number of participants	26
Duration of follow-up	2 weeks (end of intervention).
Additional comments	No additional information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear

Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 8)

Additional constraint induced movement therapy and mirror therapy for an additional 2 hours, 3 times a day CIMT and 30 minutes MT a day. Concomitant therapy: Conventional therapy 2 weeks, 5 days a weeks, with 40 minutes a day of conventional therapy

Usual care (N = 9)

Two groups. The first have additional constraint induced movement therapy and self-exercise for an additional 2 hours, 3 times a day CIMT and 30 minutes self-exercise a day. The second group received additional self-exercise for an additional 30 minutes, 2 times a day of self-exercise (this group is not included in the analysis, but included 9 participants). Concomitant therapy: Conventional therapy 2 weeks, 5 days a weeks, with 40 minutes a day of conventional therapy

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 8)	Usual care (N = 9)
% Female Nominal	2	3
Mean age (SD)	47.36 (14.4)	64.33 (8.54)

Characteristic	Mirror therapy (N = 8)	Usual care (N = 9)
Mean (SD)		
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	2	6
Haemorrhage Nominal	6	3
Time period since stroke (days) Mean (SD)	24.25 (11.54)	19.33 (9.17)
Right Nominal	5	6
Left Nominal	3	3

Outcomes

Study timepoints

- Baseline
- 2 week

Mirror therapy compared to usual care at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 2 week, N = 8	Usual care, Baseline, N = 9	Usual care, 2 week, N = 9
Upper limb motor function (Wolf motor function test) (seconds) Scale range: 0-120. Final values. Mean (SD)	33.75 (22.51)	51.5 (18.3)	40.44 (21.16)	45.7 (21.4)
Motor impairment (grip strength) (kg) Not extracted in the Cochrane review as the review double reported the Fugl-Meyer Assessment value. Mean (SD)	4.38 (3.98)	6.75 (4.04)	5.7 (2.29)	6.7 (2.13)
Activities of daily living (Korean-Modified Barthel Index) Scale range: 0-100. Final value. Mean (SD)	47.63 (12.57)	66.25 (10.63)	42 (11.14)	60 (16.2)
Fugl Meyer Assessment Upper Extremity Motor Scale range: 0-66. Final value. Mean (SD)	35.38 (21.45)	47 (19.95)	47.89 (20.85)	53.33 (19.55)

Upper limb motor function (Wolf motor function test) - Polarity - Higher values are better

Motor impairment (grip strength) - Polarity - Higher values are better

Activities of daily living (Korean-Modified Barthel Index) - Polarity - Higher values are better

Fugl Meyer Assessment Upper Extremity Motor - Polarity - Higher values are better

Mirror therapy compared to usual care at end of intervention - dichotomous outcomes

Outcome	Mirror therapy, Baseline, N = 8	Mirror therapy, 2 week, N = 8	Usual care, Baseline, N = 9	Usual care, 2 week, N = 9
Dropouts Nominal	NA	0	NA	0

Dropouts - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Upperlimbmotorfunction(Wolfmotorfunctiontest)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Motorfunction(Gripstrength)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-Activitiesofdailyliving(Korean-ModifiedBarthelIndex)-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-continuousoutcomes-FuglMeyerAssessmentUpperExtremityMotor-MeanSD-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtousualcareatendofintervention-dichotomousoutcomes-Dropouts-Nominal-Mirror therapy-Usual care-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Yun, 2011

Bibliographic Reference	Yun, Gi Jeong; Chun, Min Ho; Park, Ji Young; Kim, Bo Ryun; The synergic effects of mirror therapy and neuromuscular electrical stimulation for hand function in stroke patients; Annals of rehabilitation medicine; 2011; vol. 35 (no. 3); 316

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	South Korea.
Study setting	Inpatient rehabilitation centre.
Study dates	March 2009 to March 2010.
Sources of funding	Not stated.
Inclusion criteria	1st unilateral stroke; Brunnstrom recovery stage I - IV; MMSE > 21.
Exclusion criteria	unco-operative due to cognitive impairment; medically unstable; neurologic deficit; neglect.

Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=40 Two groups combined. One group (n=20) received mirror therapy (participants performed flexion and extension of fingers and wrist while looking in the mirror) with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy. The second group (n=20) received mirror therapy and neuromuscular electrical stimulation therapy with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy and neuromuscular electrical stimulation.
Comparator	Sham therapy N=20 Neuromuscular electrical stimulation was applied to extensor muscles on the paretic side and simultaneously underwent flexion and extension of fingers and wrist an the non-paretic side while looking at the wooden board with a conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of sham therapy.
Number of participants	60
Duration of follow-up	3 weeks (end of intervention).
Additional comments	Publish and unpublished information.
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear Majority in the region of the middle cerebral artery (either TACS or PACS).
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 40)

Two groups combined. One group (n=20) received mirror therapy (participants performed flexion and extension of fingers and wrist while looking in the mirror) with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy. The second group (n=20) received mirror therapy and neuromuscular electrical stimulation therapy with conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of mirror therapy and neuromuscular electrical stimulation.

Sham therapy (N = 20)

Neuromuscular electrical stimulation was applied to extensor muscles on the paretic side and simultaneously underwent flexion and extension of fingers and wrist an the non-paretic side while looking at the wooden board with a conventional rehabilitation programme for 3 weeks, 5 days a week with 30 minutes of sham therapy.

Characteristics

Arm-level characteristics

Characteristic	Mirror therapy (N = 40)	Sham therapy (N = 20)
% Female Nominal	14	7
Mean age (SD) Mean (SD)	64.5 (9.3)	61 (8.4)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Infarction Nominal	31	15
Haemorrhage Nominal	9	5
Time period since stroke (days) Mean (SD)	24.8 (12.6)	28.1 (12.8)

Characteristic	Mirror therapy (N = 40)	Sham therapy (N = 20)
Middle cerebral artery Nominal	30	16
Brain stem Nominal	5	3
Multiple Nominal	5	1

Outcomes

Study timepoints

- Baseline
- 3 week

Mirror therapy compared to sham therapy at end of intervention - continuous outcomes

Outcome	Mirror therapy, Baseline, N = 40	Mirror therapy, 3 week, N = 40	Sham therapy, Baseline, N = 20	Sham therapy, 3 week, N = 20
Fugl-Meyer Upper Extremity motor Scale range: 0-66. Final value. Mean (SD)	4.8 (5.6)	16 (11.3)	5.3 (3.3)	15.3 (6.9)

Outcome	Mirror therapy, Baseline, N = 40	Mirror therapy, 3 week, N = 40	Sham therapy, Baseline, N = 20	Sham therapy, 3 week, N = 20
Activities of daily living (Modified Ashworth Scale) Scale range: 0-4. Final value. Mean (SD)	0.3 (0.5)	0.7 (0.5)	0.4 (0.5)	0.8 (0.8)

Fugl-Meyer Upper Extremity motor - Polarity - Higher values are better

Activities of daily living (Modified Ashworth Scale) - Polarity - Lower values are better

Mirror therapy compared to sham therapy at end of intervention - dichotomous outcome

Outcome	Mirror therapy, Baseline, N = 40	Mirror therapy, 3 week, N = 40	Sham therapy, Baseline, N = 20	Sham therapy, 3 week, N = 20
Dropout Nominal	NA	0	NA	0

Dropout - Polarity - Lower values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Fugl-MeyerUpperExtremitymotor-MeanSD-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-continuousoutcomes-Activitiesofdailyliving(ModifiedAshworthScale)-MeanSD-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Mirrortherapycomparedtoshamtherapyatendofintervention-dichotomousoutcome-Dropout-Nominal-Mirror therapy-Sham therapy-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Zacharis, 2014

Bibliographic Reference	Zacharis, D; Moumtzi, E; Terzis, N; Roussos, N; Patatoukas, D; The use of mirror therapy in stroke patients with hemiplegic upper limb: a randomized controlled trial; Annals of Physical and Rehabilitation Medicine; 2014; (no. 57); e27

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Greece.
Study setting	Not stated.
Study dates	March 2013 to November 2013.
Sources of funding	Not stated.
Inclusion criteria	> 4 weeks after stroke, upper limb plegia (Motricity Index ≤ 77).
Exclusion criteria	Not stated.
Recruitment / selection of participants	No additional information.
Intervention(s)	Mirror therapy N=15 Additional mirror therapy (30 minutes a day) and routine rehabilitation treatment (8 weeks - 20-24 sessions).
Comparator	Usual care N=15 Routine rehabilitation treatment (8 weeks - 20-24 sessions).

Number of participants	30
Duration of follow-up	8 weeks (end of intervention)
Additional comments	This information was based on an abstract.
Subgroup 1: Acute/subacute or chronic stroke	Not stated/unclear
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	No additional information.

Study arms

Mirror therapy (N = 15)

Additional mirror therapy (30 minutes a day) and routine rehabilitation treatment (8 weeks - 20-24 sessions).

Usual care (N = 15)

Routine rehabilitation treatment (8 weeks - 20-24 sessions).

Characteristics

Study-level characteristics

Characteristic	Study (N = 30)
% Female Nominal	NR
Mean age (SD) Mean (SD)	NR (NR)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR
Time period since stroke Mean (SD)	NR (NR)

Zhang, 2021

Bibliographic Reference	Zhang, Xiang; Zhang, Yi; Liu, Yu; Yao, Qiujin; Effectiveness of mirror therapy on upper limb function, activities of daily living, and depression in post-stroke depression patients.; Turkish journal of physical medicine and rehabilitation; 2021; vol. 67 (no. 3); 365-369

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Inpatients in the Department of Rehabilitation, The Third Affiliated Hospital of Soochow University, Changzhou, China
Study dates	November 2018 and December 2019
Sources of funding	The authors received no financial support for the research and/or authorship of this article.

Inclusion criteria	First-time stroke with a confirmed diagnosis by computed tomography and magnetic resonance imaging; patients who met the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V) criteria for depressive disorder; patients who suffered from hemiplegia with upper limb functions (Brunnstrom Stage 1-4; setting balance level >I, limb muscle tension improvement level ≤2, as assessed by the Modified Ashworth Scale [MAS]); patients who were in the lucid state of mind and able to understand simple instructions and to cooperate with the treatment; patients with a 17-item Hamilton Depression Scale (HAMD-17) of ≥7; patients having normal vision without no visual field defect; and patients and/or their relatives who were aware of and willing to give a consent for the study.
Exclusion criteria	Having upper limb bone fractures or other injuries and having a history of depression before the stroke; using medical drugs which may affect the mood; and previous mirror therapy.
Recruitment / selection of participants	People who were hospitalized in the center.
Intervention(s)	The MT group received occupational therapy for one session per day for five days per week, 30 min per session over a total of four weeks. Based on the occupational therapy, MT was also provided throughout the whole course (one session per day for five days per week and each session lasted 1 h). During the MT, the patients were instructed to sit up straight and put their two upper limbs on the table. A mirror was placed on the midsagittal plane between the limbs. The front of the mirror faced toward the healthy part, while its back faced toward the dysfunctional part. The patients were instructed to lean their body slightly toward the healthy part so that they could observe the mirror image of their healthy upper limb's movement, while their dysfunctional part, hidden by the mirror, remained unseen. Quietness was maintained in the therapeutic environment. Based on the degree of difficulty, the researchers instructed the patients to make 10 movements using their healthy upper limb in the following order: flexion and tension of the elbow joint, palmar flexion and dorsal extension of the wrist, wrist ulnar deviation and radial deviation, making a thumb-up gesture, an empty-hand grip, hook-form grip, cylindrical form grip, sphere form grip, finger-to-finger movement, and side pinch. The patients were instructed to observe the mirror image.
Comparator	The control group received occupational therapy for five days per week, two sessions per day, 30 min per session over a total of four weeks. Occupational therapy consisted of therapeutic occupational activity training, sensory training, and ADL training. The content of the training was developed by the therapists for each individual patient. The baseline treatment lasted for four weeks, the frequency was one session five days per week, and the duration of each session was 1 h.
Number of participants	60
Duration of follow-up	4 weeks

Additional comments	NR
Subgroup 1: Acute/subacute or chronic stroke	Acute/subacute stroke (less than and equal to 6 months)
Subgroup 2: Level of supervision	Supervised
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Type of stroke (using the Bamford scale)	Not stated/unclear
Subgroup 5: Limb therapy is used for	Upper extremity
Subgroup analysis - further details	NR

Study arms

Mirror therapy (N = 30)

One 30 min session once per day, five times per week over four weeks plus regular occupational therapy (two times per day for 30 min per session, five times per week over four weeks)

Usual care (N = 30)

Regular occupational therapy was provided for the control group (two times per day for 30 min per session, five times per week over four weeks)

Characteristics

Arm-level characteristics

Characteristic	**Mirror therapy (N = 30)**	**Usual care (N = 30)**
% Female Sample size	n = 15 ; % = 50	n = 12 ; % = 40
Mean age (SD) Mean (SD)	57 (10.4)	59.9 (11.8)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR
Time period since stroke (days)	29.5 (7.8)	31.5 (8.9)

Characteristic	Mirror therapy (N = 30)	Usual care (N = 30)
Mean (SD)		

Outcomes

Study timepoints

- Baseline
- 4 week

Continuous outcomes

Outcome	Mirror therapy, Baseline, N = 30	Mirror therapy, 4 week, N = 30	Usual care, Baseline, N = 30	Usual care, 4 week, N = 30
Fugl-Meyer Assessment Upper Extremity Scale range: 0-66. Final values. Mean (SD)	16.8 (5)	26.3 (6.4)	15.6 (3.9)	20 (5.1)
Activities of daily living (MBI) Scale range: 0-100. Final values. Mean (SD)	35.9 (8.8)	58 (10.3)	38.7 (10)	43.1 (10)

Fugl-Meyer Assessment Upper Extremity - Polarity - Higher values are better

Activities of daily living (MBI) - Polarity - Higher values are better

Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Continuousoutcomes-Fugl-MeyerAssessmentUpperExtremity-finalvalues-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Activitiesofdailyliving(MBI)-finalvalues-MeanSD-Mirror therapy-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Appendix E – Forest plots

Figure 2: Person/participant generic health-related quality of life (EQ-5D, SF-8 [different scale ranges], higher values are better, final values) at the end of the intervention

	Mirror therapy			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Choi 2019	42.3	10.29	24	37.45	6.62	12	49.1%	0.51 [-0.19, 1.22]
Michielsen 2011	0.76	0.13	17	0.81	0.12	19	50.9%	-0.39 [-1.05, 0.27]
Total (95% CI)			**41**			**31**	**100.0%**	**0.05 [-0.83, 0.94]**

Heterogeneity: Tau² = 0.29; Chi² = 3.36, df = 1 (P = 0.07); I² = 70%
Test for overall effect: Z = 0.11 (P = 0.91)

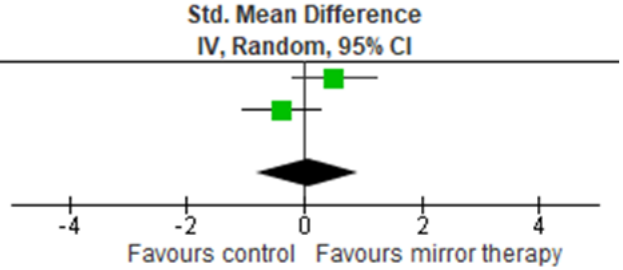


Figure 3: Person/participant generic health-related quality of life (EQ-5D, -0.11-1, higher values are better, final value) at 6 months

	Mirror therapy			Control			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Michielsen 2011	0.76	0.2	16	0.79	0.14	16	-0.03 [-0.15, 0.09]

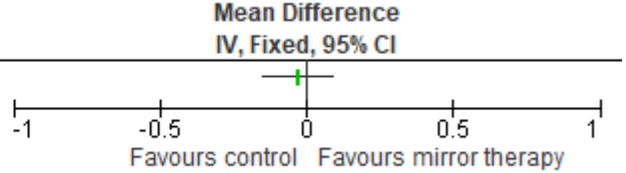


Figure 4: Upper limb and hand motor function (ARAT, 0-57, higher values are better, change score) at the end of intervention

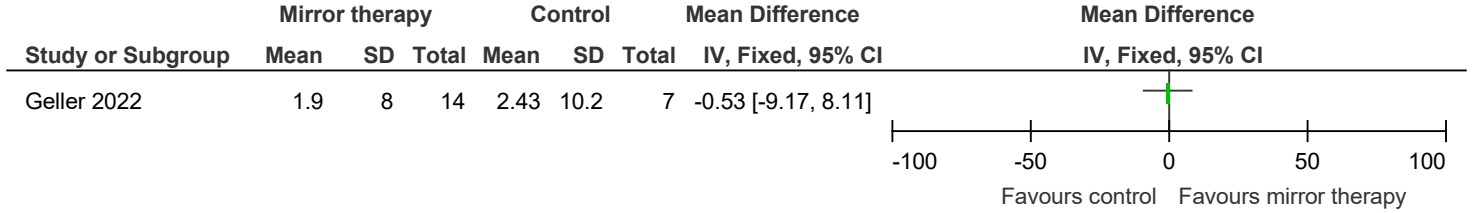


Figure 5: Upper limb and hand motor function (ARAT, MAS, BBT, WMFT, MFT, TEMPA, Upper Extremity Functional Index Scale [different scale ranges], higher values are better, final values) at the end of intervention

	Mirror therapy			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Acerra 2007	3.7	1.3	20	2.8	1.3	20	2.5%	0.68 [0.04, 1.32]
Alibakhshi 2016	7.6	7.7	12	0.8	1.2	12	1.9%	1.19 [0.31, 2.07]
Amasyali 2016	13.9	11.2	9	15.86	13.65	15	2.0%	-0.15 [-0.98, 0.68]
Antoniotti 2019	30	24.1	20	31.9	23	20	2.5%	-0.08 [-0.70, 0.54]
Bae 2012	17.1	3.03	10	14.2	2.34	10	1.8%	1.03 [0.08, 1.97]
Bai 2019	40.71	13.08	23	30.82	12.71	11	2.2%	0.74 [0.00, 1.49]
Cacchio 2009A	-1.5	0.7	24	-3.4	0.9	24	2.2%	2.32 [1.57, 3.06]
Cacchio 2009B	-2.2	0.8	8	-3.7	1.2	16	1.8%	1.33 [0.39, 2.27]
Chan 2018	-61.7	44.9	15	-49.4	39.2	20	2.4%	-0.29 [-0.96, 0.39]
Cho 2015	37.21	9.62	14	25.62	9.03	13	2.0%	1.20 [0.37, 2.03]
Choi 2019	12.88	2.34	24	10.08	1.93	12	2.2%	1.24 [0.48, 1.99]
Colomer 2016	10.1	1.8	15	12.6	1.8	16	2.1%	-1.35 [-2.14, -0.56]
Ehrensberger 2019	38.06	22.17	18	36.71	21.47	17	2.4%	0.06 [-0.60, 0.72]
Hiragami 2012	2.9	1	7	2.6	1.9	7	1.6%	0.18 [-0.87, 1.24]
Hsieh 2020	22.29	18.18	7	17.71	14.43	7	1.6%	0.26 [-0.79, 1.32]
Hsu 2022	16.4	18	35	14.9	20.9	17	2.6%	0.08 [-0.50, 0.66]
In 2012	22.36	3.98	11	21	4.97	8	1.9%	0.29 [-0.62, 1.21]
Invernizzi 2013	47.64	15.19	13	33.67	20.33	12	2.1%	0.76 [-0.06, 1.57]
Ji 2014a	45.5	12.4	23	35.5	10.9	12	2.3%	0.82 [0.09, 1.55]
Kaviraya 2021	22	7.05	15	28.86	6.25	15	2.2%	-1.00 [-1.77, -0.24]
Kim 2014	12.4	3.5	12	9.6	2.7	11	2.0%	0.86 [-0.00, 1.72]
Kim 2015A	13.6	9.2	20	12.56	12.76	9	2.1%	0.10 [-0.69, 0.88]
Kim 2016A	36.2	3.4	12	33.4	3.1	13	2.0%	0.83 [0.01, 1.66]
Kim 2017	12.9	3.31	10	11.89	3.72	9	1.9%	0.27 [-0.63, 1.18]
Kim 2018A	30.87	14.32	8	20.45	20.07	12	1.9%	0.55 [-0.36, 1.47]
Kim 2022	19.5	6.09	24	16.33	4.12	12	2.3%	0.56 [-0.15, 1.27]
Kojima 2014	45.2	13	6	40.1	19.3	7	1.5%	0.28 [-0.81, 1.38]
Lee 2012	11.4	2.7	13	9.3	4	13	2.1%	0.60 [-0.19, 1.38]
Lee 2019B	29.17	3.89	12	24.84	5.38	12	2.0%	0.89 [0.04, 1.74]
Li 2019	46.58	9.39	12	50.27	14.93	11	2.0%	-0.29 [-1.11, 0.54]
Lin 2014A	17.1	14.3	28	19.9	15.2	14	2.4%	-0.19 [-0.83, 0.45]
Madhoun 2020	3.17	0.65	15	2.97	0.9	15	2.3%	0.25 [-0.47, 0.97]
Mathieson 2018	15.3	13.1	23	17.5	14.3	12	2.3%	-0.16 [-0.86, 0.54]
Michielsen 2011	25.5	17.4	17	21.1	16.8	19	2.4%	0.25 [-0.41, 0.91]
Nagapattinam 2015	28.7	11.5	40	28.4	9.1	20	2.7%	0.03 [-0.51, 0.56]
Park 2015B	49.4	16.9	15	37.3	11.4	15	2.2%	0.82 [0.07, 1.57]
Piravej 2012	0.6	0.9	20	0.7	0.7	20	2.5%	-0.12 [-0.74, 0.50]
Rodrigues 2016	-51	16.2	8	-32.5	29	8	1.7%	-0.74 [-1.77, 0.28]
Samuelkamaleshkumar 2014	6.6	8.4	10	0.7	2.2	10	1.8%	0.92 [-0.01, 1.85]
Schick 2017	5.9	9.2	15	6.3	9.7	17	2.3%	-0.04 [-0.74, 0.65]
Seok 2010	17.6	10.5	19	17.9	8.9	21	2.5%	-0.03 [-0.65, 0.59]
Thieme 2013	3.1	8.9	39	3.1	7.1	21	2.7%	0.00 [-0.53, 0.53]
Tyson 2015	20	23	57	17	21	28	2.9%	0.13 [-0.32, 0.59]
Wang 2015	73.5	7.2	30	63	11.9	60	2.9%	0.98 [0.52, 1.45]
Yavuzer 2008	3.6	1.2	17	2.8	1	19	2.4%	0.71 [0.03, 1.39]
Yoon 2014	51.5	18.3	8	45.7	21.4	9	1.8%	0.28 [-0.68, 1.23]
Total (95% CI)			**813**			**701**	**100.0%**	**0.36 [0.18, 0.54]**

Heterogeneity: Tau² = 0.25; Chi² = 125.78, df = 45 (P < 0.00001); I² = 64%

Test for overall effect: Z = 3.86 (P = 0.0001)

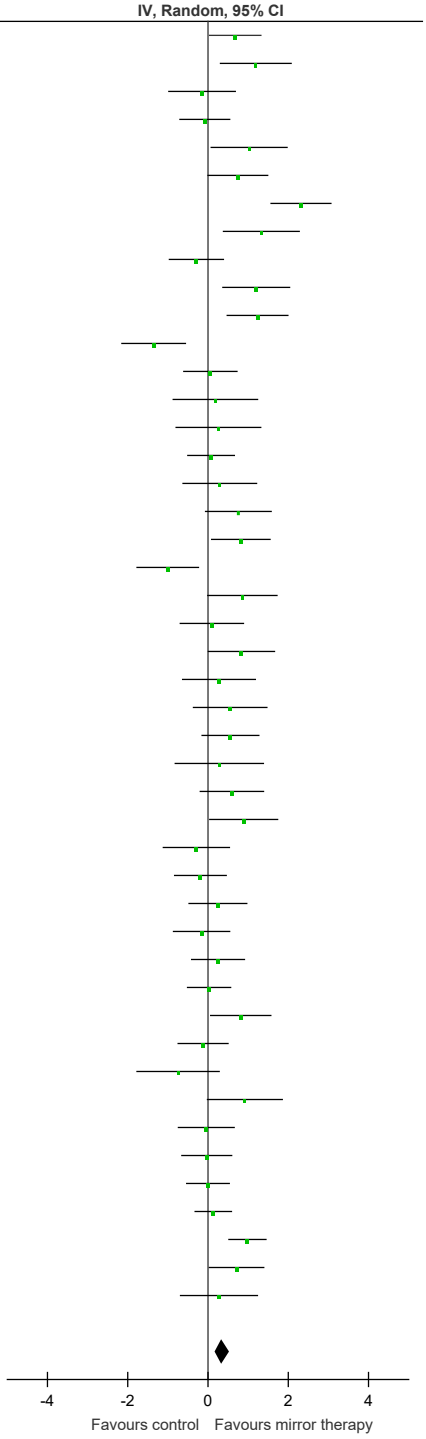


Figure 6: Upper limb and hand motor function (Motor Activity log - Amount of use subscale, 0-5, higher values are better, final value) at the end of intervention

	Mirror therapy			Control			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Hung 2022	1.98	0.94	12	1.54	0.55	12	0.44 [-0.18, 1.06]	

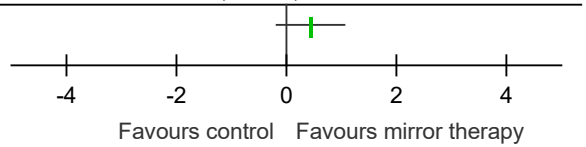


Figure 7: Upper limb and hand motor function (Motor Activity log - Amount of use subscale, 0-5, higher values are better, final value) at the end of intervention

	Mirror therapy			Control			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Hung 2022	1.98	0.94	12	1.54	0.55	12	0.44 [-0.18, 1.06]	

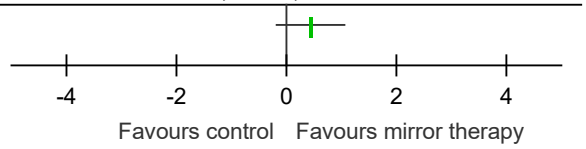


Figure 8: Upper limb and hand motor function (Motor Activity log - Quality of movement subscale, 0-5, higher values are better, final value) at the end of intervention

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Hung 2022	1.35	0.9	12	1.03	0.65	12	0.32 [-0.31, 0.95]

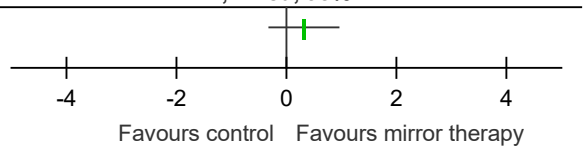


Figure 9: Upper limb and hand motor function (ARAT, WMFT [different scale ranges], higher values are better, final values) at 6 months

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Cacchio 2009A	-1.9	1.2	24	-4.2	0.8	24	49.8%	2.22 [1.49, 2.95]
Michielsen 2011	24.6	18.7	16	20.9	17.6	16	50.2%	0.20 [-0.50, 0.89]
Total (95% CI)			**40**			**40**	**100.0%**	**1.21 [-0.77, 3.18]**

Heterogeneity: Tau² = 1.91; Chi² = 15.40, df = 1 (P < 0.0001); I² = 94%
Test for overall effect: Z = 1.19 (P = 0.23)

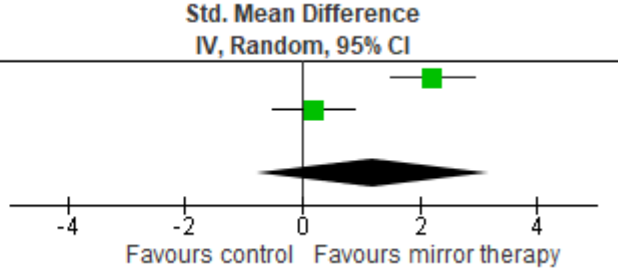


Figure 10: Lower limb motor function (BBS, 0-56, higher values are better, change scores) at the end of intervention

	Mirror therapy			Control				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Armat 2022	2	1.49	19	0.3	0.48	19	56.5%	1.70 [1.00, 2.40]	
Cui 2022	21.75	10.46	16	10.69	8.62	16	43.5%	11.06 [4.42, 17.70]	
Total (95% CI)			**35**			**35**	**100.0%**	**5.77 [-3.32, 14.87]**	

Heterogeneity: Tau² = 38.00; Chi² = 7.55, df = 1 (P = 0.006); I² = 87%

Test for overall effect: Z = 1.24 (P = 0.21)

Figure 11: Lower limb motor function (BBS, MAS, Brunel Balance Assessment, Balance Index [different scale ranges], higher values are better, final values) at the end of the intervention

	Mirror therapy			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Cha 2015	56.7	11	19	53.1	9.6	17	10.9%	0.34 [-0.32, 1.00]
Ding 2019	44.6	12.82	10	26.4	19.31	10	8.4%	1.06 [0.11, 2.01]
Hyun-Gyu 2016	47.8	3.97	13	39.2	2.9	12	7.5%	2.38 [1.31, 3.44]
Ikizler May 2020	36.1	9	21	14.9	13.8	21	10.3%	1.79 [1.06, 2.51]
In 2016	49.1	2.7	13	46.1	3	12	9.2%	1.02 [0.18, 1.86]
Lee 2016	46.3	4.2	14	37.6	13.9	13	9.7%	0.84 [0.04, 1.63]
Lee 2019A	48.13	5.17	15	40.27	9.48	15	9.9%	1.00 [0.24, 1.77]
Liu 2021	38.4	9.71	31	36.8	12.5	15	11.3%	0.15 [-0.47, 0.76]
Marquez 2012	1	1.4	5	0.8	1.4	10	7.4%	0.13 [-0.94, 1.21]
Mohan 2013	5.4	0.81	11	3.45	1.37	11	8.0%	1.67 [0.67, 2.66]
Oliveira 2018	-15.4	10.99	7	-22.6	10.0345	7	7.4%	0.64 [-0.44, 1.72]
Total (95% CI)			**159**			**143**	**100.0%**	**0.97 [0.56, 1.38]**

Heterogeneity: Tau² = 0.29; Chi² = 26.33, df = 10 (P = 0.003); I² = 62%

Test for overall effect: Z = 4.62 (P < 0.00001)

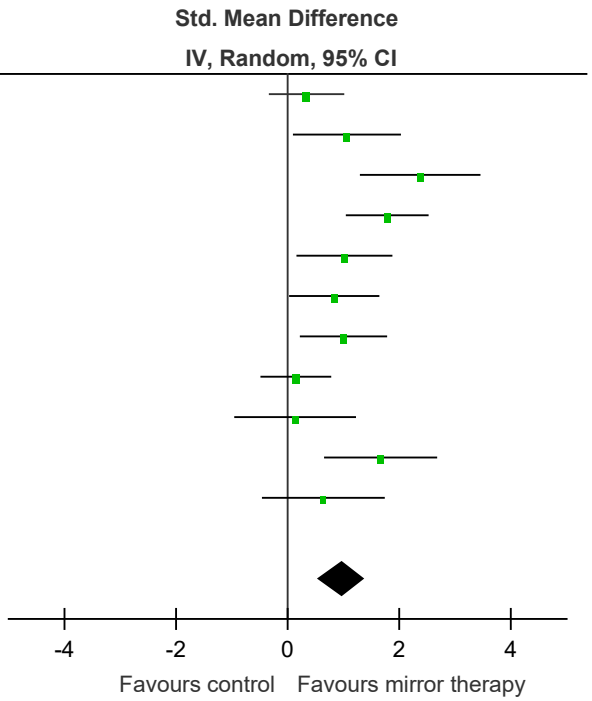


Figure 12: Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at the end of intervention

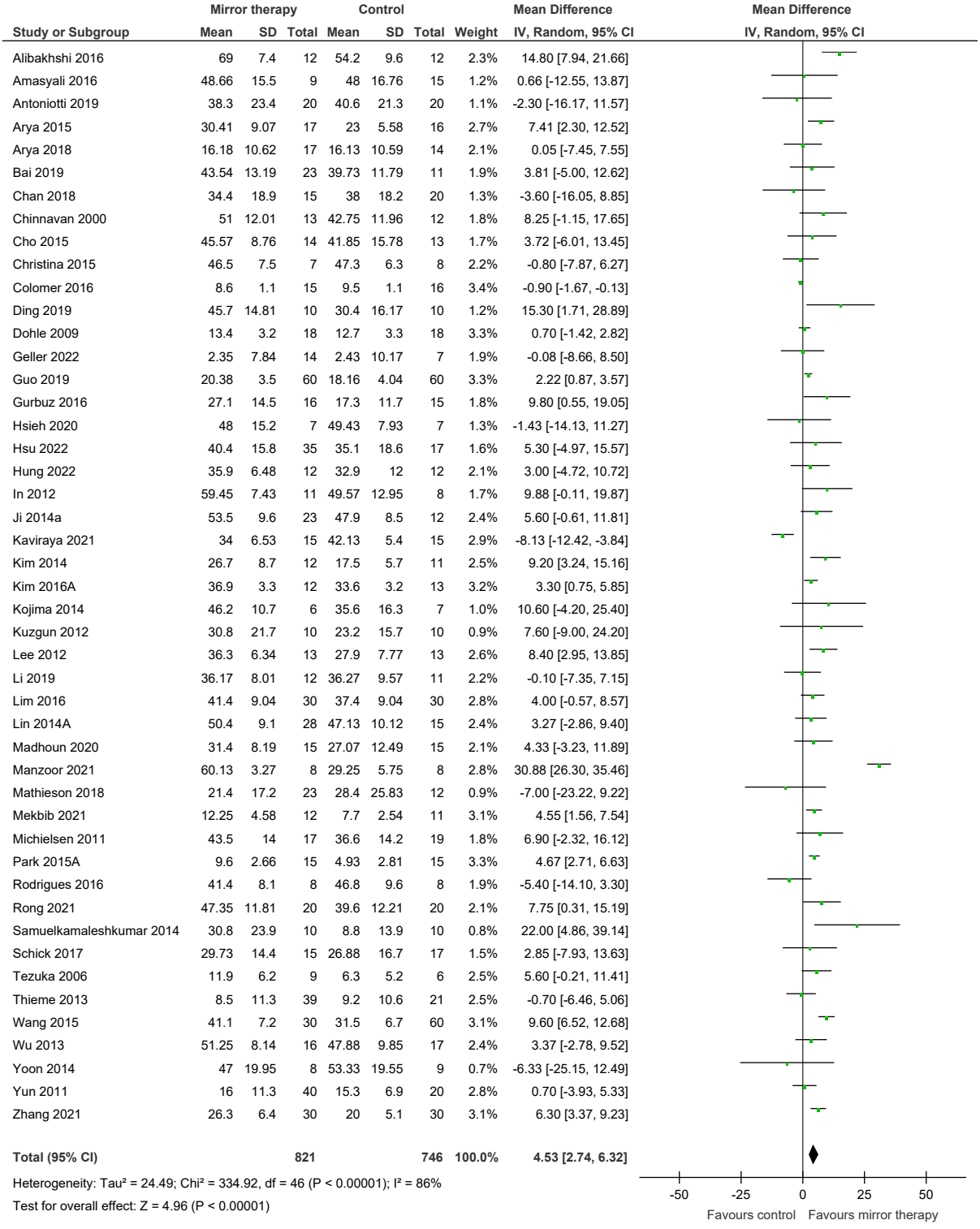


Figure 13: Fugl-Meyer Assessment Upper Extremity (Shoulder, elbow and forearm subscale, 0-36, higher values are better, final value) at the end of intervention

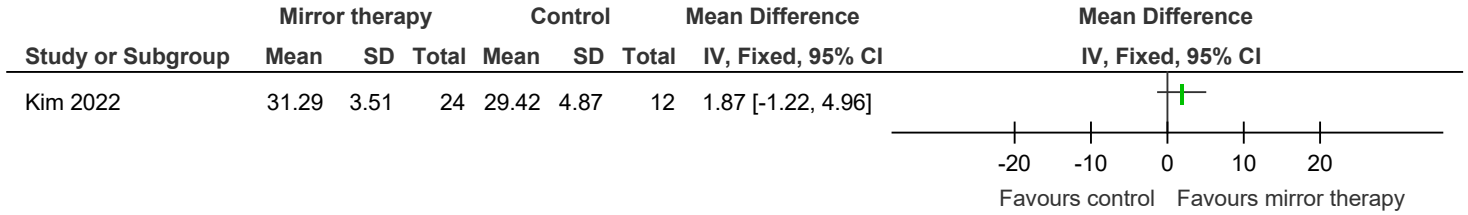


Figure 14: Fugl-Meyer Assessment Upper Extremity (Wrist subscale, 0-10, higher values are better, final value) at the end of intervention

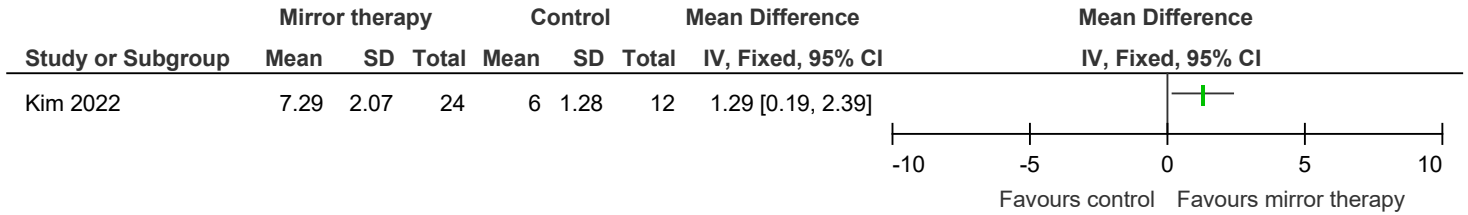


Figure 15: Fugl-Meyer Assessment Upper Extremity (Hand subscale, 0-14, higher values are better, final value) at the end of intervention

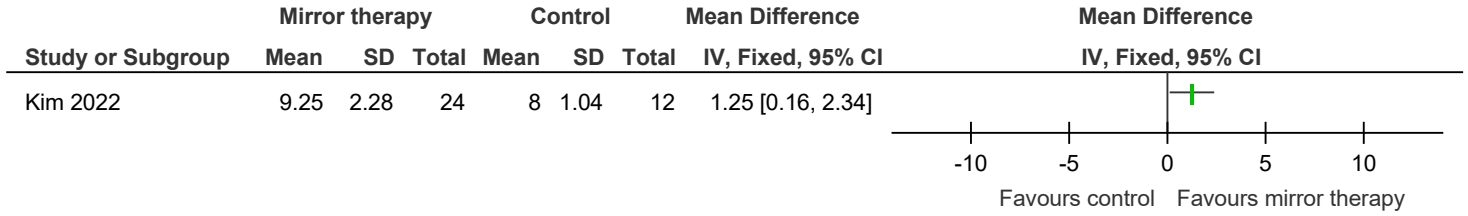


Figure 16: Fugl-Meyer Assessment Upper Extremity (Coordination subscale, 0-6, higher values are better, final value) at the end of intervention

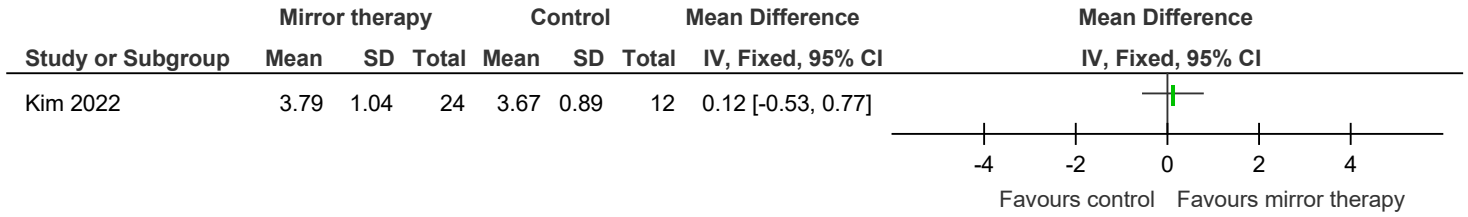


Figure 17: Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at 6 months

	Mirror therapy			Control				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Guo 2019	25.98	4.37	60	21.72	3.105	60	98.4%	4.26 [2.90, 5.62]
Michielsen 2011	41.4	14.9	16	36.3	16.2	16	1.6%	5.10 [-5.68, 15.88]
Total (95% CI)			**76**			**76**	**100.0%**	**4.27 [2.93, 5.62]**

Heterogeneity: Chi² = 0.02, df = 1 (P = 0.88); I² = 0%
Test for overall effect: Z = 6.22 (P < 0.00001)

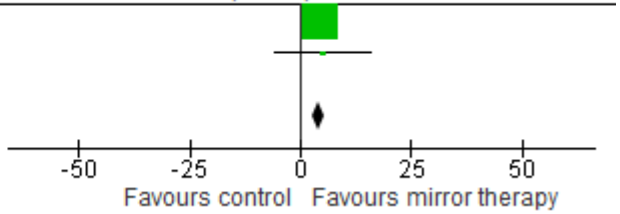


Figure 18: Measures of motor impairment (Fugl Meyer Lower Extremity, modified Brunnstrom stages, House-Brackmann facial nerve grading system, motricity index [different scale ranges], higher values are better, final values) at the end of intervention

			Mirror therapy	Control		Std. Mean Difference	Std. Mean Difference
Study or Subgroup	**Std. Mean Difference**	**SE**	**Total**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Arya 2019	0.0837	0.334	19	17	5.7%	0.08 [-0.57, 0.74]	
Broderick 2019	0.4504	0.3704	15	15	5.2%	0.45 [-0.28, 1.18]	
Chaudhari 2019	1.0072	0.3017	25	25	6.2%	1.01 [0.42, 1.60]	
Cui 2022	0.7148	0.3662	16	16	5.2%	0.71 [-0.00, 1.43]	
De 2017	-0.4886	0.3714	15	15	5.2%	-0.49 [-1.22, 0.24]	
Hassan 2015	0.5024	0.3717	15	15	5.2%	0.50 [-0.23, 1.23]	
Hatwar 2019	0.4943	0.3495	18	16	5.5%	0.49 [-0.19, 1.18]	
Ikizler May 2020	0.9771	0.3283	21	21	5.8%	0.98 [0.33, 1.62]	
Invernizzi 2013	1.016	0.4298	13	12	4.5%	1.02 [0.17, 1.86]	
Kumar 2013	0.5019	0.3717	15	15	5.2%	0.50 [-0.23, 1.23]	
Liu 2021	0.1748	0.3151	31	15	6.0%	0.17 [-0.44, 0.79]	
Marquez 2012	-0.5454	0.5599	5	10	3.2%	-0.55 [-1.64, 0.55]	
Mohan 2013	1.8316	0.5241	11	11	3.5%	1.83 [0.80, 2.86]	
Oliveira 2018	1.8508	0.6753	7	7	2.5%	1.85 [0.53, 3.17]	
Seok 2010	0.1765	0.3173	19	21	5.9%	0.18 [-0.45, 0.80]	
Sütbeyaz 2007	0.652	0.3254	20	20	5.8%	0.65 [0.01, 1.29]	
Tyson 2015	0.0644	0.2308	57	28	7.3%	0.06 [-0.39, 0.52]	
Wang 2017	0.5746	0.341	18	18	5.6%	0.57 [-0.09, 1.24]	
Xu 2017	1.133	0.274	46	23	6.6%	1.13 [0.60, 1.67]	
Total (95% CI)			**386**	**320**	**100.0%**	**0.55 [0.31, 0.79]**	

Heterogeneity: Tau² = 0.15; Chi² = 40.52, df = 18 (P = 0.002); I² = 56%

Test for overall effect: Z = 4.46 (P < 0.00001)

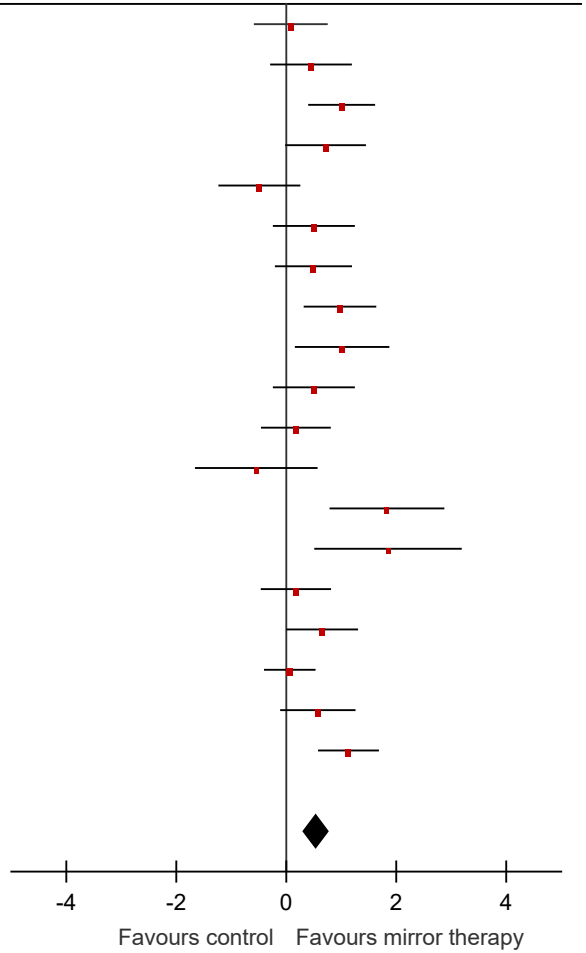


Figure 19: Measures of motor impairment (grip strength, quadriceps strength [kg], higher values are better, change score and final values) at the end of intervention

	Mirror therapy			Control				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Acerra 2007	13.7	5.8	20	9.6	3.8	20	7.7%	4.10 [1.06, 7.14]
Amasyali 2016	5.11	4.64	9	4.47	4.98	15	5.2%	0.64 [-3.30, 4.58]
Cho 2015	15.29	2.16	14	12.31	2.72	13	14.2%	2.98 [1.12, 4.84]
Geller 2022	-2.1	13.9	14	-6.19	5.4	7	1.4%	4.09 [-4.22, 12.40]
Kim 2017	11.88	5.32	10	9.16	2.8	9	5.5%	2.72 [-1.05, 6.49]
Kim 2018A	15.37	8.46	8	10.81	10.43	12	1.3%	4.56 [-3.76, 12.88]
Kim 2018B	44.5	9.8	20	41.6	8.8	10	1.9%	2.90 [-4.04, 9.84]
Michielsen 2011	12.3	9.9	17	15.2	8.5	19	2.4%	-2.90 [-8.96, 3.16]
Piravej 2012	2.4	0.8	20	2.5	0.8	20	26.6%	-0.10 [-0.60, 0.40]
Rong 2021	3.28	0.65	20	2.22	1.03	20	26.3%	1.06 [0.53, 1.59]
Yoon 2014	6.75	4.04	8	6.7	2.13	9	7.4%	0.05 [-3.08, 3.18]
Total (95% CI)			**160**			**154**	**100.0%**	**1.28 [0.29, 2.27]**

Heterogeneity: Tau² = 0.89; Chi² = 26.47, df = 10 (P = 0.003); I² = 62%

Test for overall effect: Z = 2.54 (P = 0.01)

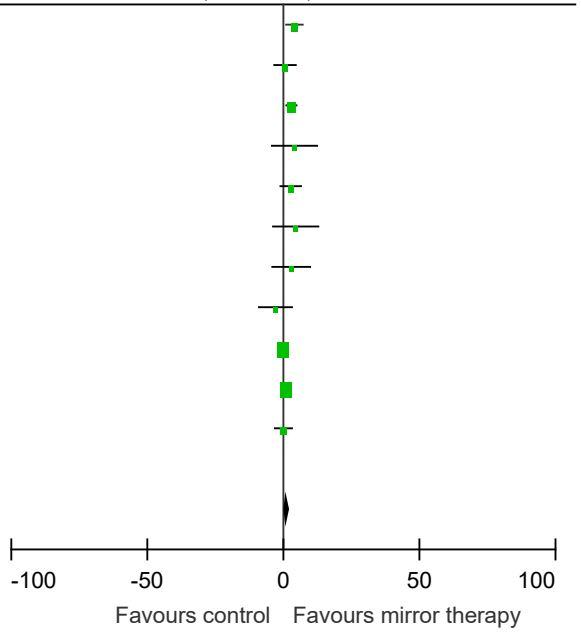


Figure 20: Measures of motor impairment (grip strength [lb], higher values are better, change score and final values) at the end of intervention

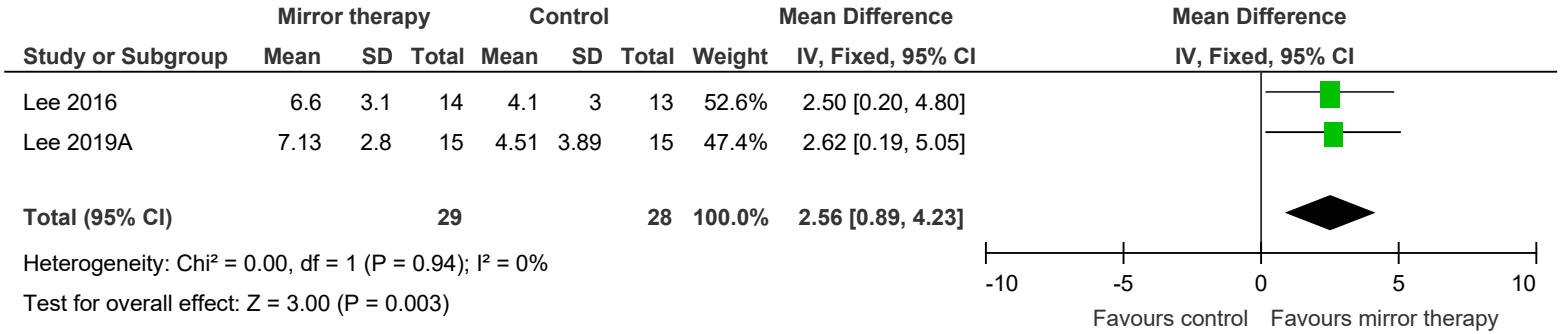


Figure 21: Measures of motor impairment (Brunnstrom stages, 1-6, higher values are better, final values) at 6 months

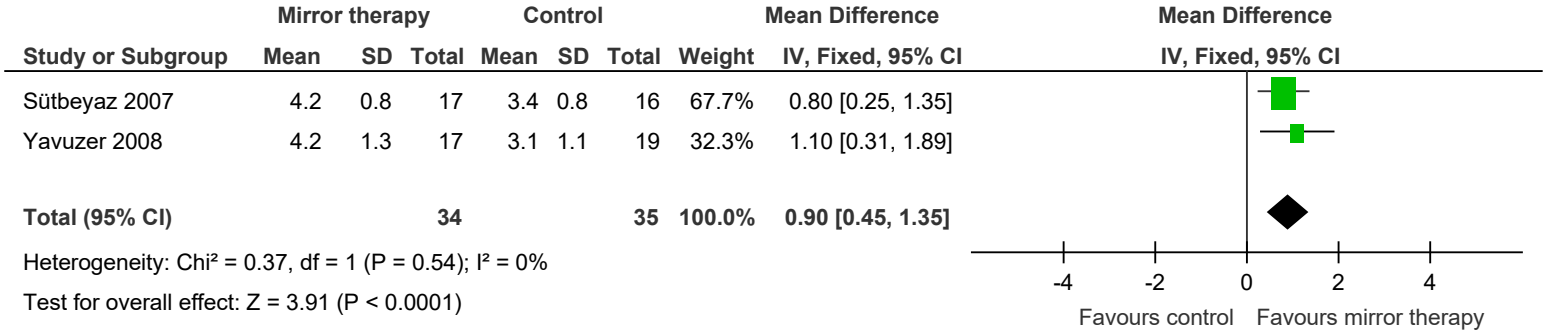


Figure 22: Measures of motor impairment (grip strength [kg], higher values are better, final value) at 6 months

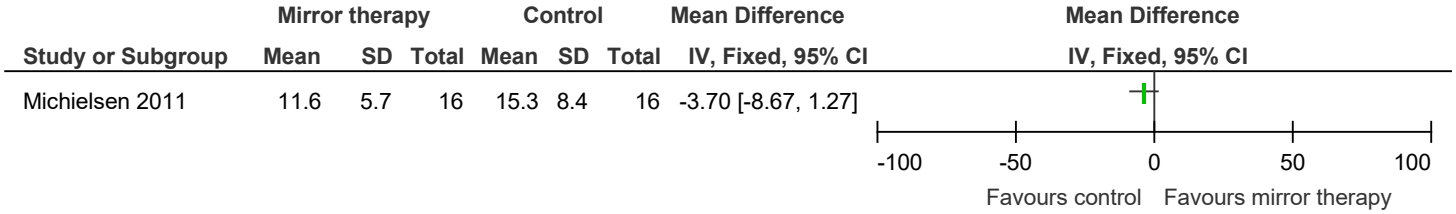


Figure 23: Activities of daily living (MBI, 0-100, higher values are better, change score) at the end of intervention

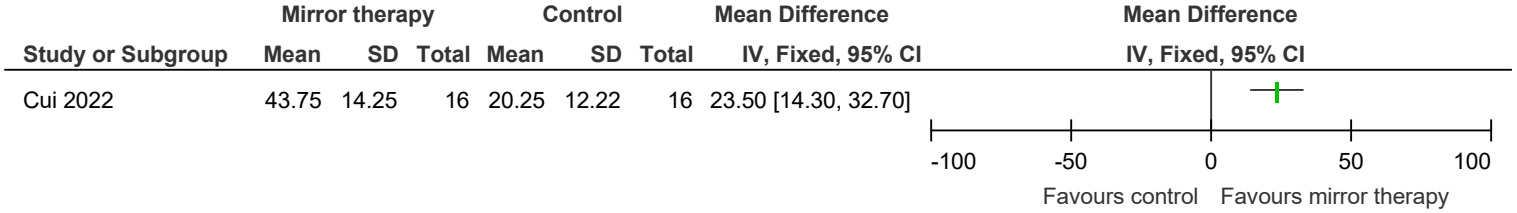


Figure 24: Activities of daily living (MBI, FIM, ABILHAND, motor activity log, modified Ashworth scale [different scale ranges], higher values are better, final values) at the end of intervention

	Mirror therapy			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Antoniotti 2019	99.4	22.6	20	100.3	21.9	20	3.1%	-0.04 [-0.66, 0.58]
Bai 2019	79.35	12.84	23	70.45	19.93	11	2.7%	0.56 [-0.17, 1.30]
Chinnavan 2000	71.46	12.82	13	61.58	16.21	12	2.4%	0.66 [-0.15, 1.47]
Ding 2019	105.3	22.31	10	82.7	25.49	10	2.1%	0.90 [-0.03, 1.83]
Dohle 2009	66.6	9.4	18	60.8	13	18	3.0%	0.50 [-0.16, 1.16]
Ehrensberger 2019	59.53	16.46	18	59.85	16.93	17	3.0%	-0.02 [-0.68, 0.64]
Gurbuz 2016	19.8	8.1	16	16.9	6.4	15	2.8%	0.39 [-0.33, 1.10]
Hiragami 2012	37.7	3.9	7	33.1	7.5	7	1.7%	0.72 [-0.37, 1.81]
Hsieh 2020	116	4.69	7	119.71	4.5	7	1.7%	-0.76 [-1.85, 0.34]
Ikizler May 2020	105.2	12.8	21	69.9	22.1	21	2.7%	1.92 [1.18, 2.66]
Invernizzi 2013	93.2	22.1	13	67.4	13.2	12	2.2%	1.36 [0.47, 2.24]
Kim 2015A	29.6	4.3	20	25.56	2.3	9	2.4%	1.03 [0.19, 1.87]
Kim 2016A	77.3	6.3	12	72.6	4.3	13	2.4%	0.85 [0.02, 1.67]
Kim 2017	29.5	2.17	10	27.33	3.08	9	2.0%	0.79 [-0.16, 1.73]
Kojima 2014	1.14	0.97	6	0.65	1.06	7	1.7%	0.45 [-0.66, 1.56]
Kuzgun 2012	72.6	26.8	10	63.9	26	10	2.2%	0.32 [-0.57, 1.20]
Lim 2016	59.63	15.58	30	51.37	16.34	30	3.6%	0.51 [-0.00, 1.03]
Lin 2014A	1.3	2.6	28	1.1	1.3	15	3.1%	0.09 [-0.54, 0.71]
Liu 2021	72.3	20.3	31	72.3	21.5	15	3.2%	0.00 [-0.62, 0.62]
Madhoun 2020	72.27	16.58	15	70.13	19.25	15	2.8%	0.12 [-0.60, 0.83]
Mathieson 2018	64.2	18.9	23	65.9	18.8	12	2.8%	-0.09 [-0.79, 0.61]
Mekbib 2021	32.27	6.84	12	28	7.15	11	2.3%	0.59 [-0.25, 1.43]
Pandian 2014	3.2	1	26	2.5	0.8	19	3.2%	0.75 [0.13, 1.36]
Park 2015A	8.8	4.12	15	4.06	4.92	15	2.6%	1.02 [0.25, 1.78]
Park 2015B	24.5	5.7	15	20	5	15	2.6%	0.82 [0.07, 1.57]
Piravej 2012	77.3	12.6	20	68.8	12.6	20	3.1%	0.66 [0.02, 1.30]
Rong 2021	71.75	21.73	20	62.9	13.33	20	3.1%	0.48 [-0.15, 1.11]
Saha 2021	88.33	18.72	19	66.38	15.33	19	2.8%	1.26 [0.55, 1.96]
Schick 2017	75.7	20.9	15	64.7	23.7	17	2.8%	0.48 [-0.23, 1.18]
Sütbeyaz 2007	65.9	4.8	20	61.7	14.6	20	3.1%	0.38 [-0.25, 1.00]
Thieme 2013	57	16.6	39	62.5	22.8	21	3.5%	-0.29 [-0.82, 0.25]
Wang 2017	20.67	6.97	18	16.17	6.07	18	2.9%	0.67 [-0.00, 1.35]
Wu 2013	1.49	1.08	16	1.62	1.36	17	2.9%	-0.10 [-0.79, 0.58]
Yavuzer 2008	28.9	10	17	22.2	6.3	19	2.9%	0.79 [0.11, 1.48]
Yoon 2014	66.25	10.63	8	60	16.2	9	2.0%	0.43 [-0.54, 1.39]
Yun 2011	0.7	0.5	40	0.8	0.8	20	3.5%	-0.16 [-0.70, 0.38]
Zhang 2021	58	10.3	30	43.1	10	30	3.3%	1.45 [0.88, 2.02]
Total (95% CI)			**681**			**575**	**100.0%**	**0.51 [0.34, 0.68]**

Heterogeneity: Tau² = 0.15; Chi² = 76.38, df = 36 (P < 0.0001); I² = 53%

Test for overall effect: Z = 5.83 (P < 0.00001)

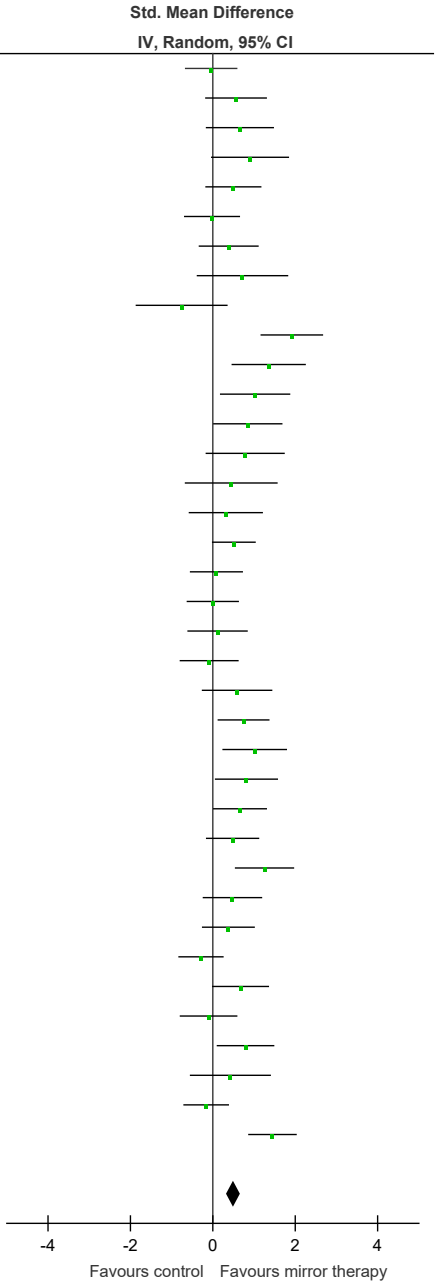


Figure 25: Activities of daily living (FIM, modified ADL [different scale ranges], higher values are better, final values) at 6 months

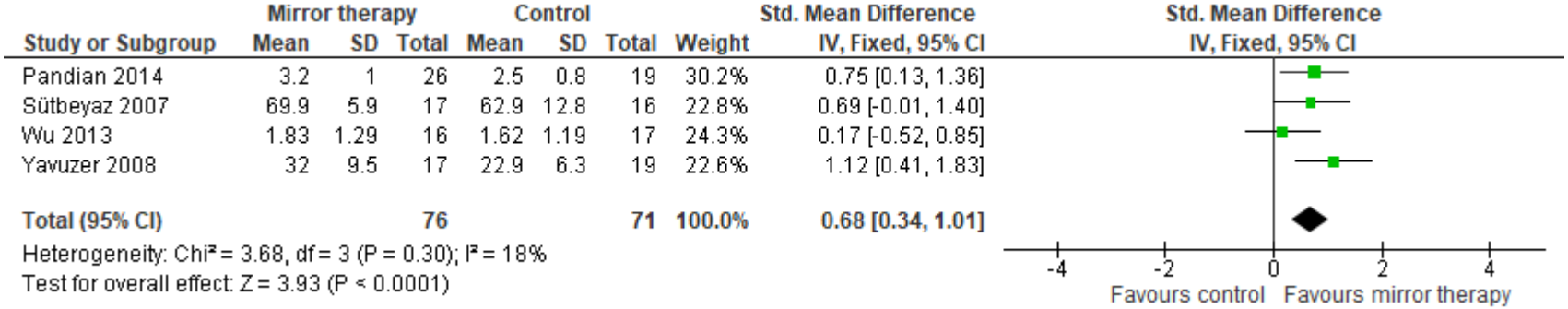


Figure 26: Pain (NRS, 0-10, lower values are better, change score) at the end of intervention

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Acerra 2007	0.1	0.3	20	0.6	1.4	20	-0.50 [-1.13, 0.13]

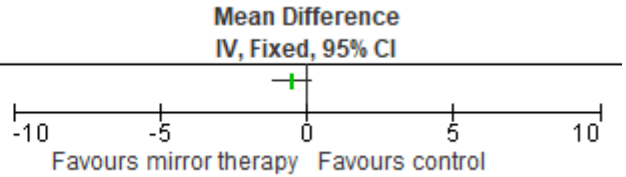


Figure 27: Pain (VAS, NRS, Fugl Meyer Assessment pain subscale [different scale ranges], lower values are better, final values) at the end of intervention

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Cacchio 2009A	4.3	2.5	24	7.2	2.2	24	18.2%	-1.21 [-1.83, -0.59]
Cacchio 2009B	14.8	4.5	8	75.5	11.6	16	9.1%	-5.91 [-7.93, -3.90]
Dohle 2009	-1.7	0.2	18	-1.7	0.2	18	18.0%	0.00 [-0.65, 0.65]
Michielsen 2011	8.8	10.8	17	9.2	14.1	19	18.0%	-0.03 [-0.69, 0.62]
Saha 2021	3.93	1.39	19	5.33	0.98	19	17.8%	-1.14 [-1.83, -0.45]
Thieme 2013	-19.6	4.3	39	-18.1	4.5	21	18.7%	-0.34 [-0.87, 0.20]
Total (95% CI)			**125**			**117**	**100.0%**	**-1.03 [-1.85, -0.21]**

Heterogeneity: Tau² = 0.86; Chi² = 39.76, df = 5 (P < 0.00001); I² = 87%
Test for overall effect: Z = 2.47 (P = 0.01)

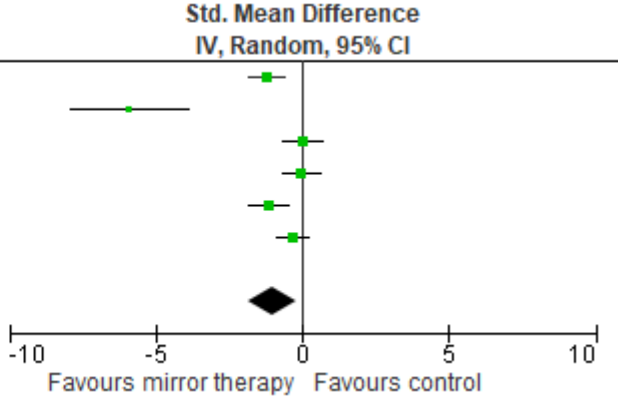


Figure 28: Pain (VAS, 0-100, lower values are better, final values) at 6 months

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Cacchio 2009A	47	26	24	81	20	24	50.4%	-34.00 [-47.12, -20.88]
Michielsen 2011	8	12.8	16	14.9	25.3	16	49.6%	-6.90 [-20.79, 6.99]
Total (95% CI)			**40**			**40**	**100.0%**	**-20.55 [-47.11, 6.01]**

Heterogeneity: Tau² = 319.67; Chi² = 7.72, df = 1 (P = 0.005); I² = 87%
Test for overall effect: Z = 1.52 (P = 0.13)

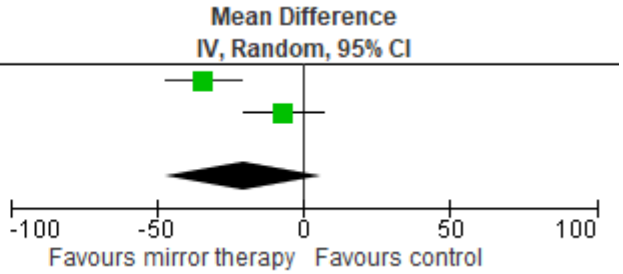


Figure 29: Visuospatial neglect (star cancellation, 0-54, higher is better, final values) at the end of intervention

Study or Subgroup	Mirror therapy Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Dohle 2009	48.1	9.3	14	31.2	9.2	9	24.6%	16.90 [9.16, 24.64]
Moustapha 2012	37.3	18.3	4	29	20.3	4	2.1%	8.30 [-18.48, 35.08]
Thieme 2013	44.8	11	8	39.7	8.8	6	13.7%	5.10 [-5.28, 15.48]
Tyson 2015	50	11	57	50	11	28	59.6%	0.00 [-4.98, 4.98]
Total (95% CI)			**83**			**47**	**100.0%**	**5.03 [1.19, 8.88]**

Heterogeneity: Chi² = 13.03, df = 3 (P = 0.005); I² = 77%
Test for overall effect: Z = 2.57 (P = 0.01)

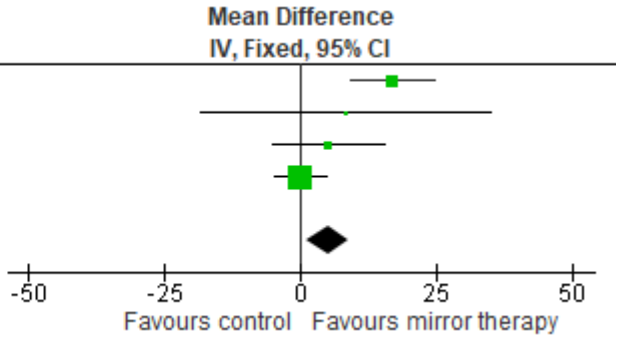


Figure 30: Visuospatial neglect (star cancellation test, 0-54, higher values are better, final value) at 6 months

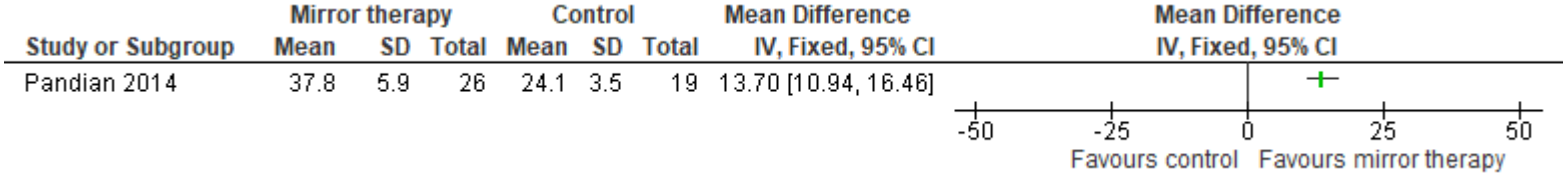


Figure 31: Stroke-specific Patient-Reported Outcome Measures (SIS, 0-100, higher values are better, change score) at the end of intervention

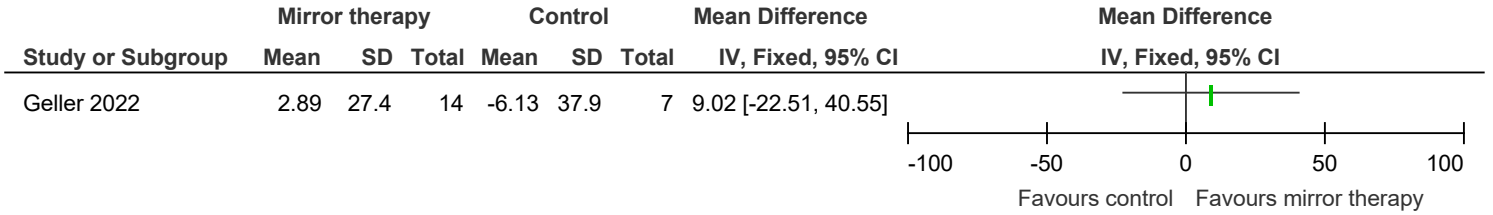


Figure 32: Stroke-specific Patient-Reported Outcome Measures (SIS, SS-QOL, LHS [different scale ranges], higher values are better, final values) at the end of intervention

	Mirror therapy			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Ehrensberger 2019	0.5	0.21	18	0.53	0.27	17	19.3%	-0.12 [-0.79, 0.54]
Hsieh 2020	76.79	6.25	7	78.12	8.97	7	7.7%	-0.16 [-1.21, 0.89]
Kim 2015A	175.4	28.26	20	161.33	30.85	9	13.4%	0.47 [-0.33, 1.27]
Li 2019	71.38	9.44	12	64.56	17.4	11	12.3%	0.48 [-0.36, 1.31]
Simpson 2019	0.53	0.19	16	0.53	0.27	15	17.1%	0.00 [-0.70, 0.70]
Thieme 2013	-55.8	11.4	39	-57.2	17	21	30.2%	0.10 [-0.43, 0.63]
Total (95% CI)			**112**			**80**	**100.0%**	**0.12 [-0.18, 0.41]**

Heterogeneity: Chi² = 2.35, df = 5 (P = 0.80); I² = 0%
Test for overall effect: Z = 0.78 (P = 0.43)

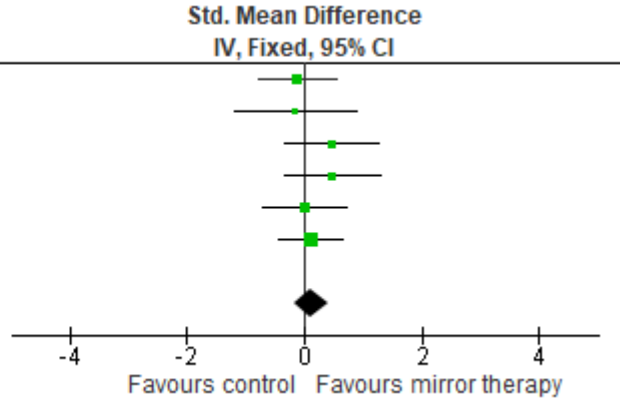


Figure 33: Adverse events at the end of intervention

Study or Subgroup	Mirror therapy Events	Mirror therapy Total	Control Events	Control Total	Weight	Risk Difference M-H, Fixed, 95% CI
Acerra 2007	0	20	0	20	13.3%	0.00 [-0.09, 0.09]
Guo 2019	0	60	0	60	40.0%	0.00 [-0.03, 0.03]
Hsieh 2020	0	7	0	7	4.7%	0.00 [-0.24, 0.24]
Hsu 2022	0	35	0	17	15.3%	0.00 [-0.08, 0.08]
Invernizzi 2013	0	13	0	13	8.7%	0.00 [-0.14, 0.14]
Mohan 2013	0	11	0	11	7.3%	0.00 [-0.16, 0.16]
Schick 2017	0	15	0	17	10.6%	0.00 [-0.11, 0.11]
Total (95% CI)		**161**		**145**	**100.0%**	**0.00 [-0.03, 0.03]**
Total events	0		0			

Heterogeneity: Chi² = 0.00, df = 6 (P = 1.00); I² = 0%

Test for overall effect: Z = 0.00 (P = 1.00)

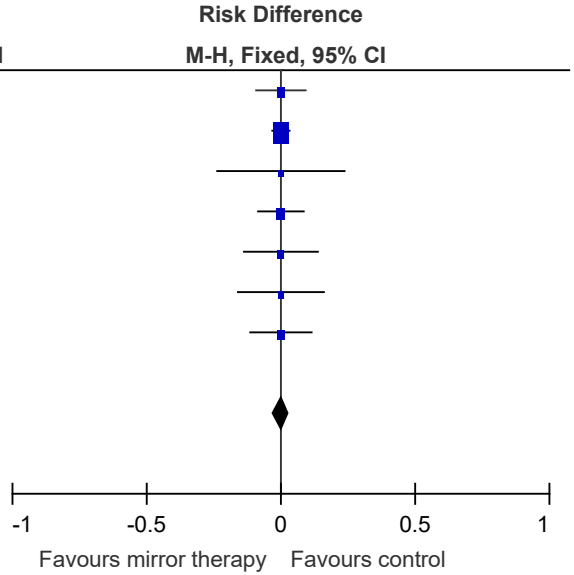


Figure 34: Adverse events at 6 months

Study or Subgroup	Mirror therapy Events	Mirror therapy Total	Control Events	Control Total	Weight	Risk Difference M-H, Fixed, 95% CI
Guo 2019	0	60	0	60	71.7%	0.00 [-0.03, 0.03]
Pandian 2014	0	27	0	21	28.3%	0.00 [-0.08, 0.08]
Total (95% CI)		**87**		**81**	**100.0%**	**0.00 [-0.03, 0.03]**
Total events	0		0			

Heterogeneity: Chi² = 0.00, df = 1 (P = 1.00); I² = 0%

Test for overall effect: Z = 0.00 (P = 1.00)

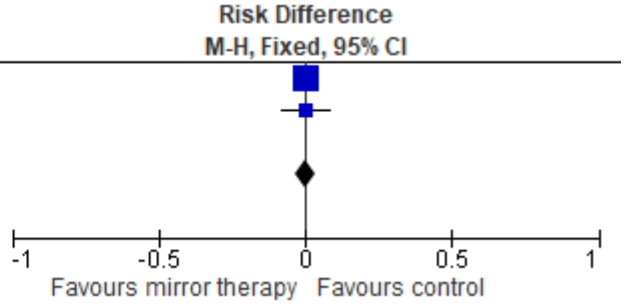


Figure 35: Dropouts at the end of intervention

Study or Subgroup	Mirror therapy Events	Total	Control Events	Total	Weight	Risk Difference M-H, Fixed, 95% CI
Acerra 2007	0	20	0	20	1.7%	0.00 [-0.09, 0.09]
Alibakhshi 2016	0	12	0	12	1.0%	0.00 [-0.15, 0.15]
Altschuler 1999	0	4	0	5	0.4%	0.00 [-0.34, 0.34]
Amasyali 2016	2	9	1	15	1.0%	0.16 [-0.14, 0.46]
Antoniotti 2019	4	20	1	20	1.7%	0.15 [-0.05, 0.35]
Arya 2015	0	17	1	16	1.4%	-0.06 [-0.22, 0.09]
Arya 2017	4	16	2	15	1.3%	0.12 [-0.16, 0.39]
Arya 2018	1	17	1	14	1.3%	-0.01 [-0.19, 0.16]
Arya 2019	1	19	2	17	1.5%	-0.07 [-0.25, 0.12]
Bahrami 2013	0	25	0	25	2.1%	0.00 [-0.07, 0.07]
Bai 2019	0	23	0	11	1.3%	0.00 [-0.13, 0.13]
Bhoraniya 2018	0	13	0	13	1.1%	0.00 [-0.14, 0.14]
Cacchio 2009A	2	24	4	24	2.1%	-0.08 [-0.27, 0.10]
Cacchio 2009B	0	8	0	16	0.9%	0.00 [-0.17, 0.17]
Chan 2018	5	20	1	21	1.8%	0.20 [-0.01, 0.41]
Colomer 2016	2	17	1	17	1.5%	0.06 [-0.13, 0.25]
Cui 2022	3	16	4	16	1.4%	-0.06 [-0.35, 0.22]
Ding 2019	1	10	0	10	0.9%	0.10 [-0.14, 0.34]
Dohle 2009	6	24	6	24	2.1%	0.00 [-0.24, 0.24]
Ehrensberger 2019	1	18	2	17	1.5%	-0.06 [-0.25, 0.12]
Geller 2022	3	17	0	7	0.8%	0.18 [-0.07, 0.42]
Hatwar 2019	1	19	3	19	1.6%	-0.11 [-0.30, 0.09]
Hiragami 2012	0	7	0	7	0.6%	0.00 [-0.24, 0.24]
Hsu 2022	1	35	1	17	2.0%	-0.03 [-0.15, 0.09]
Hyun-Gyu 2016	3	13	2	12	1.1%	0.06 [-0.25, 0.38]
Ikizler May 2020	0	21	0	21	1.8%	0.00 [-0.09, 0.09]
In 2012	3	14	2	10	1.0%	0.01 [-0.31, 0.34]
In 2016	2	13	3	12	1.1%	-0.10 [-0.41, 0.22]
Invernizzi 2013	0	13	1	13	1.1%	-0.08 [-0.27, 0.11]
Kawakami 2015	3	19	11	65	2.5%	-0.01 [-0.20, 0.18]
Kim 2014	2	14	2	13	1.2%	-0.01 [-0.28, 0.26]
Kim 2015A	2	22	1	11	1.3%	0.00 [-0.21, 0.21]
Kim 2016B	0	17	1	17	1.5%	-0.06 [-0.21, 0.09]
Kim 2017	0	10	1	10	0.9%	-0.10 [-0.34, 0.14]
Kim 2018A	4	12	0	12	1.0%	0.33 [0.05, 0.61]
Kim 2022	4	28	2	14	1.6%	0.00 [-0.22, 0.22]
Kojima 2014	0	6	0	7	0.6%	0.00 [-0.25, 0.25]
Kumar 2013	0	15	0	15	1.3%	0.00 [-0.12, 0.12]
Kuzgun 2012	0	10	0	10	0.9%	0.00 [-0.17, 0.17]
Lee 2012	1	14	1	14	1.2%	0.00 [-0.19, 0.19]
Lee 2016	1	15	2	15	1.3%	-0.07 [-0.28, 0.15]
Lee 2019A	0	15	0	15	1.3%	0.00 [-0.12, 0.12]
Li 2019	1	12	2	11	1.0%	-0.10 [-0.37, 0.18]
Lim 2016	0	30	0	30	2.6%	0.00 [-0.06, 0.06]
Lin 2014A	0	28	1	15	1.7%	-0.07 [-0.22, 0.08]
Liu 2021	0	31	0	15	1.7%	0.00 [-0.10, 0.10]
Madhoun 2020	3	18	2	17	1.5%	0.05 [-0.18, 0.28]
Marquez 2012	0	5	0	10	0.6%	0.00 [-0.25, 0.25]
Mathieson 2018	1	23	0	12	1.3%	0.04 [-0.10, 0.19]
Mekbib 2021	2	14	3	14	1.2%	-0.07 [-0.35, 0.21]
Michielsen 2011	3	20	1	20	1.7%	0.10 [-0.08, 0.28]
Mohan 2013	0	11	0	11	0.9%	0.00 [-0.16, 0.16]
Moustapha 2012	1	4	1	4	0.3%	0.00 [-0.60, 0.60]
Nagapattinam 2015	0	40	0	20	2.3%	0.00 [-0.07, 0.07]
Piravej 2012	3	23	4	24	2.0%	-0.04 [-0.24, 0.17]
Rajappan 2016	1	15	0	15	1.3%	0.07 [-0.10, 0.23]
Rodrigues 2016	0	8	0	8	0.7%	0.00 [-0.21, 0.21]
Rong 2021	0	20	0	20	1.7%	0.00 [-0.09, 0.09]
Rothgangel 2004	0	8	0	8	0.7%	0.00 [-0.21, 0.21]
Saha 2021	3	19	2	19	1.6%	0.05 [-0.16, 0.27]
Samuelkamaleshkumar 2014	0	10	0	10	0.9%	0.00 [-0.17, 0.17]
Schick 2017	1	15	0	17	1.4%	0.07 [-0.10, 0.23]
Simpson 2019	2	18	2	17	1.5%	-0.01 [-0.22, 0.20]
Sütbeyaz 2007	0	20	0	20	1.7%	0.00 [-0.09, 0.09]
Tezuka 2006	4	9	0	6	0.6%	0.44 [0.08, 0.81]
Thieme 2013	8	39	3	21	2.3%	0.06 [-0.13, 0.26]
Tyson 2015	4	63	1	31	3.6%	0.03 [-0.06, 0.12]
Wu 2013	0	16	0	17	1.4%	0.00 [-0.11, 0.11]
Xu 2017	0	46	0	23	2.6%	0.00 [-0.06, 0.06]
Yavuzer 2008	3	20	1	20	1.7%	0.10 [-0.08, 0.28]
Yun 2011	0	40	0	20	2.3%	0.00 [-0.07, 0.07]
Total (95% CI)		**1306**		**1139**	**100.0%**	**0.01 [-0.01, 0.04]**
Total events	102		82			

Heterogeneity: Chi² = 35.79, df = 70 (P = 1.00); I² = 0%

Test for overall effect: Z = 1.11 (P = 0.27)

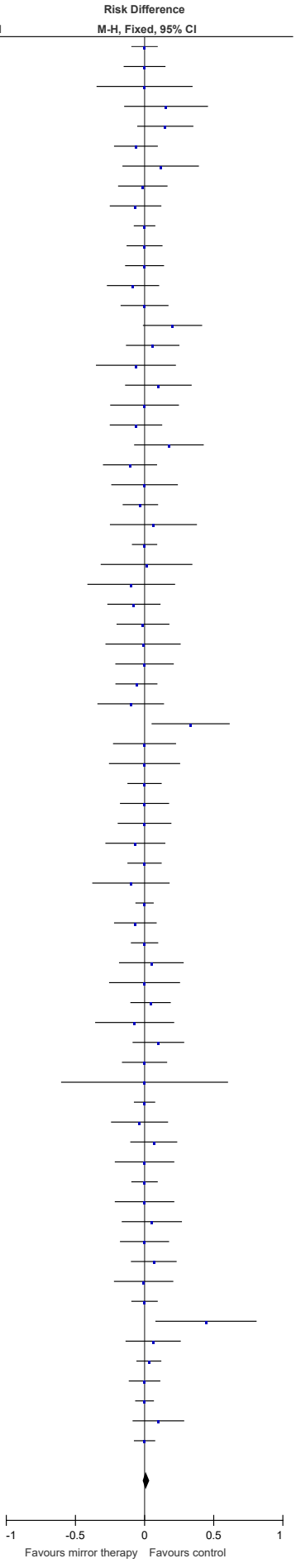
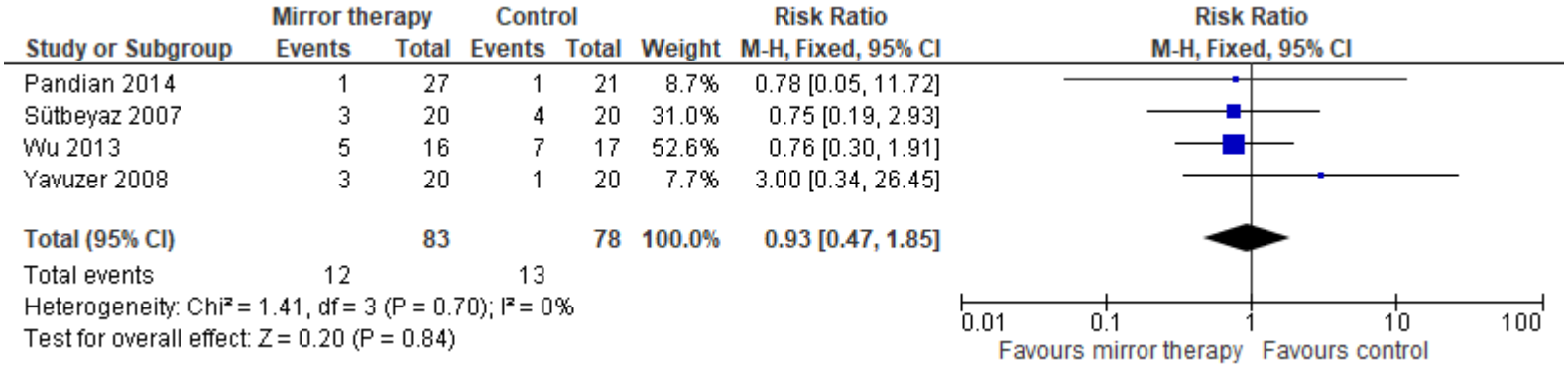


Figure 36: Dropouts at 6 months



Appendix F – GRADE tables

Table 5: Clinical evidence profile: mirror therapy compared to all other interventions

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (EQ-5D, SF-8 [different scale ranges], higher values are better, final values) at the end of the intervention (follow-up: mean 6 weeks)												
2	randomised trials	very serious[a]	serious[b]	not serious	very serious[c]	none	41	31	-	SMD **0.05 SD higher** (0.83 lower to 0.94 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (EQ-5D, -0.11-1, higher values are better, final value) at 6 months (follow-up: mean 6 months; Scale from: -0.11 to 1)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[c]	none	16	16	-	MD **0.03 lower** (0.15 lower to 0.09 higher)	⨁◯◯◯ Very low	CRITICAL
Upper limb and hand motor function (ARAT, 0-57, higher values are better, change score) at the end of intervention (follow-up: 6 weeks)												
1	randomised trials	very serious[d]	not serious	not serious	very serious[c]	none	14	7	-	MD **0.53 lower** (9.17 lower to 8.11 higher)	⨁◯◯◯ Very low	CRITICAL
Upper limb and hand motor function (ARAT, MAS, BBT, WMFT, MFT, TEMPA, Upper Extremity Functional Index Scale [different scale ranges], higher values are better, final values) at the end of intervention (follow-up: mean 4 weeks)												
46	randomised trials	very serious[e]	serious[b]	not serious	serious[c]	none	813	701	-	SMD **0.36 SD higher** (0.18 higher to 0.54 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
Upper limb and hand motor function (Motor Activity log - Amount of use subscale, 0-5, higher values are better, final value) at the end of intervention (follow-up: 5 weeks)												
1	randomised trials	serious[f]	not serious	not serious	serious[c]	none	12	12	-	MD **0.44 higher** (0.18 lower to 1.06 higher)	⨁⨁◯◯ Low	CRITICAL
Upper limb and hand motor function (Motor Activity log - Quality of movement subscale, 0-5, higher values are better, final value) at the end of intervention (follow-up: 5 weeks)												
1	randomised trials	serious[f]	not serious	not serious	very serious[c]	none	12	12	-	MD **0.32 higher** (0.31 lower to 0.95 higher)	⨁◯◯◯ Very low	CRITICAL
Upper limb and hand motor function (ARAT, WMFT [different scale ranges], higher values are better, final values) at 6 months (follow-up: mean 6 months)												
2	randomised trials	very serious[d]	very serious[b]	not serious	very serious[c]	none	40	40	-	SMD **1.21 SD higher** (0.77 lower to 3.18 higher)	⨁◯◯◯ Very low	CRITICAL
Lower limb motor function (BBS, 0-56, higher values are better, change scores) at the end of intervention (follow-up: mean 4 weeks)												
2	randomised trials	serious[g]	very serious[b]	not serious	very serious[c]	none	35	35	-	MD **5.77 higher** (3.32 lower to 14.87 higher)	⨁◯◯◯ Very low	CRITICAL
Lower limb motor function (BBS, MAS, Brunel Balance Assessment, Balance Index [different scale ranges], higher values are better, final values) at the end of the intervention (follow-up: mean 4 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
11	randomised trials	very serious[d]	serious[b]	not serious	not serious	none	159	143	-	SMD **0.97 SD higher** (0.56 higher to 1.38 higher)	⨁◯◯◯ Very low	CRITICAL

Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at the end of intervention (follow-up: mean 4 weeks)

47	randomised trials	very serious[e]	very serious[b]	not serious	not serious	none	821	746	-	MD **4.53 higher** (2.74 higher to 6.32 higher)	⨁◯◯◯ Very low	CRITICAL

Fugl-Meyer Assessment Upper Extremity (Shoulder, elbow and forearm subscale, 0-36, higher values are better, final value) at the end of intervention (follow-up: 4 weeks)

1	randomised trials	very serious[h]	not serious	not serious	serious[c]	none	24	12	-	MD **1.87 higher** (1.22 lower to 4.96 higher)	⨁◯◯◯ Very low	CRITICAL

Fugl-Meyer Assessment Upper Extremity (Wrist subscale, 0-10, higher values are better, final value) at the end of intervention (follow-up: 4 weeks)

1	randomised trials	very serious[h]	not serious	not serious	serious[c]	none	24	12	-	MD **1.29 higher** (0.19 higher to 2.39 higher)	⨁◯◯◯ Very low	CRITICAL

Fugl-Meyer Assessment Upper Extremity (Hand subscale, 0-14, higher values are better, final value) at the end of intervention (follow-up: 4 weeks)

1	randomised trials	very serious[h]	not serious	not serious	serious[c]	none	24	12	-	MD **1.25 higher** (0.16 higher to 2.34 higher)	⨁◯◯◯ Very low	CRITICAL

Fugl-Meyer Assessment Upper Extremity (Coordination subscale, 0-6, higher values are better, final value) at the end of intervention (follow-up: 4 weeks)

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[h]	not serious	not serious	serious[c]	none	24	12	-	MD **0.12 higher** (0.53 lower to 0.77 higher)	⨁◯◯◯ Very low	CRITICAL
Fugl-Meyer Assessment Upper Extremity (0-66, higher values are better, final values) at 6 months (follow-up: mean 9 months; Scale from: 0 to 66)												
2	randomised trials	serious[i]	not serious	not serious	not serious	none	76	76	-	MD **4.27 higher** (2.93 higher to 5.62 higher)	⨁⨁⨁◯ Moderate	CRITICAL
Measures of motor impairment (Fugl Meyer Lower Extremity, modified Brunnstrom stages, House-Brackmann facial nerve grading system, motricity index [different scale ranges], higher values are better, final values) at the end of intervention (follow-up: mean 4 weeks)												
19	randomised trials	very serious[e]	serious[b]	not serious	serious[c]	none	386	320	-	SMD **0.55 SD higher** (0.31 higher to 0.79 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of motor impairment (grip strength, quadriceps strength [kg], higher values are better, change score and final values) at the end of intervention (follow-up: mean 4 weeks)												
11	randomised trials	very serious[d]	serious[b]	not serious	serious[c]	none	160	154	-	MD **1.28 kg higher** (0.29 higher to 2.27 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of motor impairment (grip strength [lb], higher values are better, change score and final values) at the end of intervention (follow-up: mean 4 weeks)												
2	randomised trials	very serious[d]	not serious	not serious	serious[c]	none	29	28	-	MD **2.56 lbs higher** (0.89 higher to 4.23 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of motor impairment (Brunnstrom stages, 1-6, higher values are better, final values) at 6 months (follow-up: mean 6 months)												
2	randomised trials	very serious[d]	not serious	not serious	not serious	none	34	35	-	MD **0.9 higher** (0.45 higher to 1.35 higher)	⨁⨁◯◯ Low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
Measures of motor impairment (grip strength [kg], higher values are better, final value) at 6 months (follow-up: 6 months)												
1	randomised trials	very serious[i]	not serious	not serious	serious[c]	none	16	16	-	MD **3.7 lower** (8.67 lower to 1.27 higher)	⨁◯◯◯ Very low	CRITICAL
Activities of daily living (MBI, 0-100, higher values are better, change score) at the end of intervention (follow-up: 3 weeks)												
1	randomised trials	very serious[g]	not serious	not serious	not serious	none	16	16	-	MD **23.5 higher** (14.3 higher to 32.7 higher)	⨁⨁◯◯ Low	CRITICAL
Activities of daily living (MBI, FIM, ABILHAND, motor activity log, modified Ashworth scale [different scale ranges], higher values are better, final values) at the end of intervention (follow-up: 4 weeks)												
37	randomised trials	very serious[e]	not serious	not serious	serious[c]	none	681	575	-	SMD **0.51 SD higher** (0.34 higher to 0.68 higher)	⨁◯◯◯ Very low	CRITICAL
Activities of daily living (FIM, modified ADL [different scale ranges], higher values are better, final values) at 6 months (follow-up: mean 6 months)												
4	randomised trials	very serious[d]	not serious	not serious	serious[c]	none	76	71	-	SMD **0.68 SD higher** (0.34 higher to 1.01 higher)	⨁◯◯◯ Very low	CRITICAL
Pain (NRS, 0-10, lower values are better, change score) at the end of intervention (follow-up: 2 weeks; Scale from: 0 to 10)												
1	randomised trials	serious[k]	not serious	not serious	serious[c]	none	20	20	-	MD **0.5 lower** (1.13 lower to 0.13 higher)	⨁⨁◯◯ Low	CRITICAL
Pain (VAS, NRS, Fugl Meyer Assessment pain subscale [different scale ranges], lower values are better, final values) at the end of intervention (follow-up: mean 5 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
6	randomised trials	very serious[l]	very serious[b]	not serious	serious[c]	none	125	117	-	SMD **1.03 SD lower** (1.85 lower to 0.21 lower)	⨁◯◯◯ Very low	CRITICAL
Pain (VAS, 0-100, lower values are better, final values) at 6 months (follow-up: mean 6 months; Scale from: 0 to 100)												
2	randomised trials	very serious[l]	very serious[b]	not serious	serious[c]	none	40	40	-	MD **20.55 lower** (47.11 lower to 6.01 higher)	⨁◯◯◯ Very low	CRITICAL
Visuospatial neglect (star cancellation, 0-54, higher is better, final values) at the end of intervention (follow-up: mean 4 weeks; Scale from: 0 to 54)												
4	randomised trials	serious[m]	very serious[b]	not serious	serious[c]	none	83	47	-	MD **5.03 higher** (1.19 higher to 8.88 higher)	⨁◯◯◯ Very low	CRITICAL
Visuospatial neglect (star cancellation test, 0-54, higher values are better, final value) at 6 months (follow-up: mean 6 months; Scale from: 0 to 54)												
1	randomised trials	very serious[n]	not serious	not serious	not serious	none	26	19	-	MD **13.7 higher** (10.94 higher to 16.46 higher)	⨁⨁◯◯ Low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS, 0-100, higher values are better, change score) at the end of intervention (follow-up: 6 weeks)												
1	randomised trials	very serious[d]	not serious	not serious	very serious[c]	none	14	7	-	MD **9.02 higher** (22.51 lower to 40.55 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS, SS-QOL, LHS [different scale ranges], higher values are better, final values) at the end of intervention (follow-up: mean 6 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	mirror therapy	control (including usual care, sham therapy and no treatment)	Relative (95% CI)	Absolute (95% CI)		
6	randomised trials	very serious[l]	not serious	not serious	not serious	none	112	80	-	SMD **0.12 SD higher** (0.18 lower to 0.41 higher)	⨁⨁◯◯ Low	CRITICAL
Adverse events at the end of intervention (follow-up: mean 9 weeks)												
7	randomised trials	not serious	not serious	not serious	serious[o,p]	none	0/161 (0.0%)	0/145 (0.0%)	**RD 0.00** (-0.03 to 0.03)	**0 fewer per 1,000** (from 30 fewer to 30 more)[p]	⨁⨁⨁◯ Moderate	CRITICAL
Adverse events at 6 months (follow-up: mean 9 months)												
2	randomised trials	not serious	not serious	not serious	serious[o]	none	0/87 (0.0%)	0/81 (0.0%)	**RD 0.00** (-0.03 to 0.03)	**0 fewer per 1,000** (from 30 fewer to 30 more)[p]	⨁⨁⨁◯ Moderate	CRITICAL
Dropouts at the end of intervention (follow-up: mean 4 weeks)												
71	randomised trials	very serious[e]	not serious	not serious	very serious[o]	none	102/1306 (7.8%)	82/1139 (7.2%)	**RD 0.01** (-0.01 to 0.04)	**10 more per 1,000** (from 10 fewer to 40 more)[p]	⨁◯◯◯ Very low	CRITICAL
Dropouts at 6 months (follow-up: mean 6 months)												
3	randomised trials	serious[q]	not serious	not serious	very serious[c]	none	7/67 (10.4%)	6/61 (9.8%)	**RR 1.12** (0.41 to 3.11)	**12 more per 1,000** (from 58 fewer to 208 more)	⨁◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio; **SMD:** standardised mean difference

Explanations

a. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

b. Downgraded by 1 or 2 increments because heterogeneity, unexplained by subgroup analysis.

c. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs

d. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to deviations from the intended interventions and bias due to missing outcome data)

e. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to deviations from the intended interventions, bias due to missing outcome data, bias in measurement of the outcome and bias in selection of the reported result)

f. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias arising from the randomisation process)

g. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias arising from the randomisation process, bias due to missing outcome data and bias in selection of the reported result)

h. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviations from the intended interventions and bias due to missing outcome data)

i. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to deviations from the intended interventions)

j. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias due to deviations from the intended interventions and bias due to missing outcome data)

k. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to deviations from the intended interventions)

l. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process, bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

m. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviations from the intended interventions, bias due to missing outcome data and bias in measurement of the outcome)

n. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to deviations from the intended interventions)

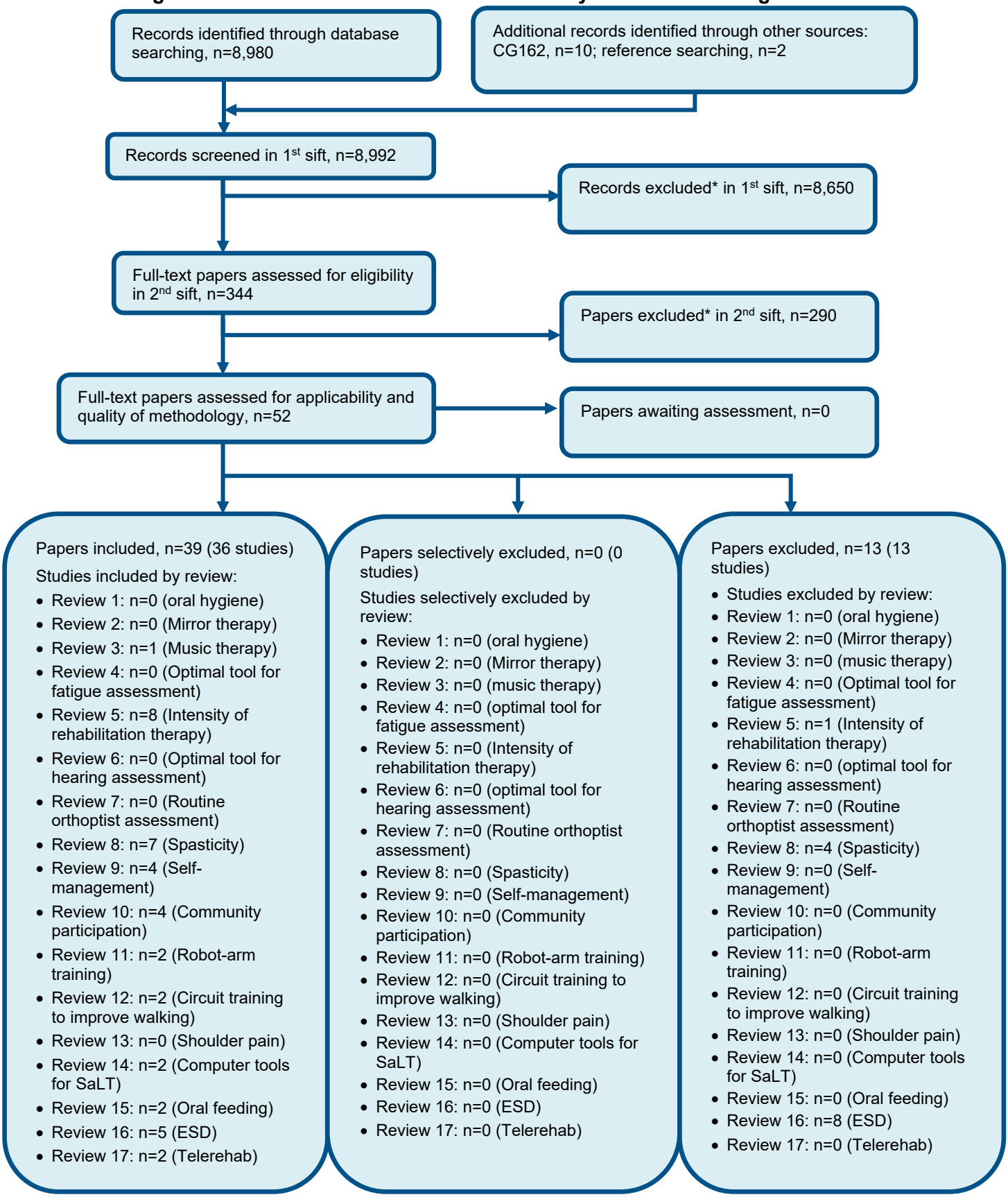
o. Downgraded by 1 to 2 increments for imprecision due to zero events and small sample size

p. Absolute effect calculated by risk difference due to zero events in at least one arm of one study

q. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias arising from the randomisation process and bias due to missing outcome data)

Appendix G – Economic evidence study selection

Figure 37: Flow chart of health economic study selection for the guideline



* Non-relevant population, intervention, comparison, design or setting; non-English language

Appendix H – Economic evidence tables

No health economic studies were included in this review.

Appendix I – Health economic model

This area was not prioritised for new cost-effectiveness analysis.

Appendix J – Excluded studies

Clinical studies

Table 6: Studies excluded from the clinical review

Study	Code [Reason]
(2017) Efficacy and safety of non-immersive virtual reality exercising in stroke rehabilitation (EVREST): a randomised, multicenter, single-blind, controlled trial. New zealand journal of physiotherapy 45(3): 170-170	- Conference abstract - Study does not contain an intervention relevant to this review protocol
Abedi, S.; Loodaricheh, A. M. A.; Akbarfahimi, N. (2019) Comparison of the effect of mirror therapy and modified constraint-induced movement therapy on upper extremity motor function in stroke patients.	- Trial registry only
Ahmed, N., Mauad, V. A. Q., Gomez-Rojas, O. et al. (2020) The Impact of Rehabilitation-oriented Virtual Reality Device in Patients With Ischemic Stroke in the Early Subacute Recovery Phase: Study Protocol for a Phase III, Single-Blinded, Randomized, Controlled Clinical Trial. Journal of Central Nervous System Disease 12: 1179573519899471	- Protocol - Study does not contain an intervention relevant to this review protocol
Ahn, S. and Hwang, S. (2019) Virtual rehabilitation of upper extremity function and independence for stoke: a meta-analysis. Journal of Exercise Rehabilitation 15(3): 358-369	- Study does not contain an intervention relevant to this review protocol
Alex, Marylyn; Wünsche, Burkhard C.; Lottridge, Danielle (2021) Virtual reality art-making for stroke rehabilitation: Field study and technology probe. International Journal of Human-Computer Studies 145: 14	- Study design not relevant to this review protocol
Ali, J. I.; Viczko, J.; Smart, C. M. (2020) Efficacy of Neurofeedback Interventions for Cognitive Rehabilitation Following Brain Injury: Systematic Review and Recommendations for Future Research. Journal of the International Neuropsychological Society : JINS 26(1): 31-46	- Study does not contain an intervention relevant to this review protocol
Alon, G, Sunnerhagen, Ks, Geurts, Ac et al. (2003) A home-based, self-administered stimulation program to improve selected hand	- Study design not relevant to this review protocol

Study	Code [Reason]
functions of chronic stroke. NeuroRehabilitation 18(3): 215-25.	
Aminov, A., Rogers, J. M., Middleton, S. et al. (2018) What do randomized controlled trials say about virtual rehabilitation in stroke? A systematic literature review and meta-analysis of upper-limb and cognitive outcomes. Journal of Neuroengineering & Rehabilitation 15(1): 29	- Systematic review used as source of primary studies
Anonymous (2014) Synergistic effects of the combined EMG-triggered multi-channel electrical stimulation and mirror therapy in subacute stroke patients with severe arm hand paresis: a randomized, controlled, multicenter study.	- Trial registry only
Anonymous (2020) Retraction: Effects of virtual reality immersive training with computerized cognitive training on cognitive function and activities of daily living performance in patients with acute stage stroke: A preliminary randomized controlled trial: Retraction (Medicine (2019) 98 11 (e14752)). Medicine 99(21): e20598	- Retraction only
Anonymous (2020) Erratum: Effects of virtual reality immersive training with computerized cognitive training on cognitive function and activities of daily living performance in patients with acute stage stroke: A preliminary randomized controlled trial (Medicine (United States) 98:11 (e14752) DOI: 10.1097/MD.0000000000014752). Medicine (United States) 99 (20)	- Retraction only
Anonymous (2020) Effects of virtual reality immersive training with computerized cognitive training on cognitive function and activities of daily living performance in patients with acute stage stroke: A preliminary randomized controlled trial: Retraction. Medicine 99(21): e20598	- Retraction only
Anonymous (2017) Erratum: therapeutic Effect of Virtual Reality on Post-Stroke Patients: randomized Clinical Trial (Journal of Stroke and Cerebrovascular Diseases (2017) 26(1) (94-100) (S105230571630307X) (10.1016/j.jstrokecerebrovasdis.2016.08.035)). Journal of stroke and cerebrovascular diseases 26(8): 1883	- Retraction only

Study	Code [Reason]
Aparicio-Lopez, C., Garcia-Molina, A., Garcia-Fernandez, J. et al. (2016) Combination treatment in the rehabilitation of visuo-spatial neglect. Psicothema 28(2): 143-9	- Study does not contain an intervention relevant to this review protocol
Aramaki, A. L., Sampaio, R. F., Reis, A. C. S. et al. (2019) Virtual reality in the rehabilitation of patients with stroke: an integrative review. Arquivos de Neuro-Psiquiatria 77(4): 268-278	- Systematic review used as source of primary studies
Aramaki, Alberto Luiz, Sampaio, Rosana Ferreira, Cavalcanti, Alessandra et al. (2019) Use of client-centered virtual reality in rehabilitation after stroke: A feasibility study. Arquivos de Neuro-Psiquiatria 77(9): 622-631	- Study design not relevant to this review protocol - Study does not contain an intervention relevant to this review protocol
Armat, M. R.; Hojjat, K.; Sarani, A. (2019) Impact of mirror therapy by trained caregiver on balance of elderly people with stroke-induced imbalance.	- Trial registry only
Arya, K. N. (2015) Role of long term task-based mirror therapy in inducing motor recovery in post stroke hemiparesis.	- Trial registry only
Arya, Kamal Narayan; Pandian, Shanta; Kumar, Dharmendra (2017) Task-based mirror therapy enhances ipsilesional motor functions in stroke: A pilot study. Journal of Bodywork and Movement Therapies 21(2): 334-341.	- Study design not relevant to this review protocol
Asha, G. (2017) Effect of mirror therapy on lower extremity muscle activation in patients with stroke.	- Trial registry only
Bai, Z., Fong, K. N. K., Zhang, J. et al. (2019) Cortical mapping of mirror visual feedback training for unilateral upper extremity: A functional near-infrared spectroscopy study. Brain and Behavior	- Population not relevant to this review protocol *Healthy participants*
Ballantyne, R. and Rea, P. M. (2019) A Game Changer: 'The Use of Digital Technologies in the Management of Upper Limb Rehabilitation'. Advances in Experimental Medicine & Biology 1205: 117-147	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Bartlett, J. (2018) Mirror therapy and treadmill training for patients with chronic stroke.	- Trial registry only
Bartur, Gadi, Pratt, Hillel, Frenkel-Toledo, Silvi et al. (2018) Neurophysiological effects of mirror visual feedback in stroke patients with unilateral hemispheric damage. Brain Research 1700: 170-180	- Study design not relevant to this review protocol
Bayon, M and Martinez, J (2010) Virtual reality-based stroke rehabilitation. Rehabilitacion 44(3): 256-60.	- Study not reported in English
Bello, U. M.; Winser, S. J.; Chan, C. C. H. (2020) Role of kinaesthetic motor imagery in mirror-induced visual illusion as intervention in post-stroke rehabilitation. Reviews in the Neurosciences 31(6): 659-674	- Population not relevant to this review protocol *Healthy participants*
Bergmann, J. (2014) Lokomat gait training with sensory feedback - effects of virtual reality-enriched Lokomat training on walking related outcomes and motivation in subjects with subacute stroke.	- Trial registry only
Bergmann, J., Krewer, C., Bauer, P. et al. (2018) Virtual reality to augment robot-assisted gait training in non-ambulatory patients with a subacute stroke: a pilot randomized controlled trial. European journal of physical & rehabilitation medicine. 54(3): 397-407	- Study does not contain an intervention relevant to this review protocol
Bernardi, C. L. (2017) Acute effect of mirror therapy on rehabilitation of paretic upper extremity after chronic stroke.	- Trial registry only
Bevilacqua, R., Maranesi, E., Riccardi, G. R. et al. (2019) Non-Immersive Virtual Reality for Rehabilitation of the Older People: A Systematic Review into Efficacy and Effectiveness. Journal of Clinical Medicine 8(11): 05	- Study does not contain an intervention relevant to this review protocol
Bishop, L., Omofuma, I., Stein, J. et al. (2020) Treadmill-Based Locomotor Training With Robotic Pelvic Assist and Visual Feedback: A Feasibility Study. Journal of Neurologic Physical Therapy 44(3): 205-213	- Study design not relevant to this review protocol

Study	Code [Reason]
Bondoc, S, Booth, J, Budde, G et al. (2018) Mirror therapy and task-oriented training for people with a paretic upper extremity. American Journal of Occupational Therapy 72(2): 7202205080 1-8.	- Study design not relevant to this review protocol
Brasilieiro, A, Gama, G, Trigueiro, L et al. (2015) Influence of visual and auditory biofeedback on partial body weight support treadmill training of individuals with chronic hemiparesis: A randomized controlled clinical trial. European Journal of Physical and Rehabilitation Medicine 51(1): 49-58.	- Study does not contain an intervention relevant to this review protocol
Broderick, P., Horgan, F., Blake, C. et al. (2018) Mirror therapy for improving lower limb motor function and mobility after stroke: A systematic review and meta-analysis. Gait & Posture 63: 208-220	- Systematic review used as source of primary studies
Brunner, I., Skouen, J. S., Hofstad, H. et al. (2017) Virtual Reality Training for Upper Extremity in Subacute Stroke (VIRTUES): A multicenter RCT. Neurology 89(24): 2413-2421	- Study does not contain an intervention relevant to this review protocol
Burdea, G, Cioi, D, Martin, J et al. (2011) Motor retraining in virtual reality: A feasibility study for upper-extremity rehabilitation in individuals with chronic stroke. Journal of Physical Therapy Education 25(1): 20-9.	- Study does not contain an intervention relevant to this review protocol
Cacho, R. O. (2017) Mirror therapy in post stroke individuals.	- Trial registry only
Calabro, R. S., Naro, A., Russo, M. et al. (2017) The role of virtual reality in improving motor performance as revealed by EEG: a randomized clinical trial. Journal of Neuroengineering & Rehabilitation 14(1): 53	- Study does not contain an intervention relevant to this review protocol
Cameirao, Ms, Bermudez, i Badia S, Duarte, E et al. (2012) The combined impact of virtual reality neurorehabilitation and its interfaces on upper extremity functional recovery in patients with chronic stroke. Stroke 43(10): 2720-8.	- Study does not contain an intervention relevant to this review protocol
Campos, T. (2018) Motor learning of stroke patients in virtual environments.	- Trial registry only

Study	Code [Reason]
Cano Porras, D., Siemonsma, P., Inzelberg, R. et al. (2018) Advantages of virtual reality in the rehabilitation of balance and gait: Systematic review. Neurology 90(22): 1017-1025	- Population not relevant to this review protocol
Chan, W. C. (2016) Motor recovery of the severely impaired paretic upper limb after mirror therapy in sub-acute stroke.	- Trial registry only
Chen, B., Liang, R. Q., Chen, R. Y. et al. (2021) The effect of virtual reality training on the daily participation of patients: A meta-analysis. Complementary Therapies in Medicine 58: 102676	- Systematic review used as source of primary studies
Chen, L. and Dong Feng, H. (2018) Cortical excitability of motor anticipatory in subacute stroke patients after virtual reality training: a preliminary movement-related potential study. Annals of physical and rehabilitation medicine	- Conference abstract
Chen, Qingmei, Shen, Wenjun, Sun, Haiwei et al. (2021) Effects of mirror therapy on motor aphasia after acute cerebral infarction: A randomized controlled trial. NeuroRehabilitation 49(1): 103-117	- Data not reported in an extractable format or a format that can be analysed *Medians and interquartile ranges*
Cheng, H. L. (2018) The combining rTMS with visual feedback training for patients with stroke (rTMS).	- Trial registry only
Cheng, Pt, Wang, Cm, Chung, Cy et al. (2004) Effects of visual feedback rhythmic weight-shift training on hemiplegic stroke patients. Clinical Rehabilitation 18(7): 747-53.	- Study does not contain an intervention relevant to this review protocol
Cho, D. R. and Lee, S. H. (2019) Effects of virtual reality immersive training with computerized cognitive training on cognitive function and activities of daily living performance in patients with acute stage stroke: A preliminary randomized controlled trial. Medicine 98(11): e14752	- Study does not contain an intervention relevant to this review protocol *Also, article retracted due to a lack of a formal agreement between the authors of the article and the developers of the virtual reality program*
Cho, H. Y., Song, E., Moon, J. H. et al. (2021) Effects of virtual reality based therapeutic exercise on the upper extremity function and activities of daily living in patients with acute stroke: A pilot randomized controlled trial. Medico-Legal Update 21(2): 676-682	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Cho, Sh, Shin, Hk, Kwon, Yh et al. (2007) Cortical activation changes induced by visual biofeedback tracking training in chronic stroke patients. Neurorehabilitation 22(2): 77-84.	- Study does not contain an intervention relevant to this review protocol
Choi, H. S.; Shin, W. S.; Bang, D. H. (2021) Application of digital practice to improve head movement, visual perception and activities of daily living for subacute stroke patients with unilateral spatial neglect: Preliminary results of a single-blinded, randomized controlled trial. Medicine 100(6): e24637	- Study does not contain an intervention relevant to this review protocol
Corbo, M. (2018) Mirror therapy efficacy in upper limb rehabilitation early after stroke (MT).	- Trial registry only
De Keersmaecker, E., Lefeber, N., Geys, M. et al. (2019) Virtual reality during gait training: does it improve gait function in persons with central nervous system movement disorders? A systematic review and meta-analysis. Neurorehabilitation 44(1): 43-66	- Study does not contain an intervention relevant to this review protocol
De Luca, R., Russo, M., Naro, A. et al. (2018) Effects of virtual reality-based training with BTs-Nirvana on functional recovery in stroke patients: preliminary considerations. International Journal of Neuroscience 128(9): 791-796	- Study does not contain an intervention relevant to this review protocol
de Moraes Forjaz, C. L. (2016) Acute physiological responses to virtual reality games in adults affected by stroke.	- Trial registry only
de Rooij, I. (2016) Does virtual reality gait training improve participation in patients after stroke?.	- Trial registry only
de Rooij, I. J. M., van de Port, I. G. L., Punt, M. et al. (2021) Effect of Virtual Reality Gait Training on Participation in Survivors of Subacute Stroke: Randomized Controlled Trial. Physical Therapy 16: 16	- Study does not contain an intervention relevant to this review protocol
de Rooij, I. J. M., van de Port, I. G. L., Visser-Meily, J. M. A. et al. (2019) Virtual reality gait training versus non-virtual reality gait training for improving participation in subacute stroke survivors: study protocol of the ViRTAS	- Protocol - Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
randomized controlled trial. Trials [Electronic Resource] 20(1): 89	
de, Rooij Ij; van, de Port Ig; Meijer, Jw (2016) Effect of virtual reality training on balance and gait ability in patients with stroke: Systematic review and meta-analysis. Physical Therapy 96(12): 1905-18.	- Study does not contain an intervention relevant to this review protocol
Deconinck, Fj, Smorenburg, Ar, Benham, A et al. (2015) Reflections on mirror therapy: A systematic review of the effect of mirror visual feedback on the brain. Neurorehabilitation and Neural Repair 29(4): 349-61.	- Population not relevant to this review protocol *Healthy participants*
Dominguez-Tellez, P., Moral-Munoz, J. A., Salazar, A. et al. (2020) Game-Based Virtual Reality Interventions to Improve Upper Limb Motor Function and Quality of Life After Stroke: Systematic Review and Meta-analysis. Games for Health Journal 9(1): 1-10	- Study does not contain an intervention relevant to this review protocol
Ehrensberger, M. (2018) Upper limb unilateral strength training and mirror therapy for chronic stroke patients.	- Trial registry only
Fadaei, E. and Kalantari, M. (2018) Comparison of the effect of action observation therapy and mirror therapy on upper extremity functions in patients with stroke.	- Trial registry only
Fan Effect of mirror therapy on prevention of upper limb contracture and daily living activity in stroke patients. J Hebei United Univ 17: 110-112	- Full text paper not available
Faure, C., Duret, C., Dobrev, N. et al. (2019) Mirror Therapy Rehabilitation of the Upper Limb After Stroke (NEURO-MIROIR 2).	- Trial registry only
Fong, K. N. K., Ting, K. H., Chan, C. C. H. et al. (2019) Mirror therapy with bilateral arm training for hemiplegic upper extremity motor functions in patients with chronic stroke. Hong Kong Medical Journal 25suppl3(1): 30-34	- Data not reported in an extractable format or a format that can be analysed
Gandhi, D. B. C., Sterba, A., Khatter, H. et al. (2020) Mirror Therapy in Stroke Rehabilitation: Why, How Early, and Effects: A Meta-analysis. Journal of Stroke Medicine 3(2): 72-80	- Systematic review used as source of primary studies

Study	Code [Reason]
Gandhi, D. B., Sterba, A., Khatter, H. et al. (2020) Mirror Therapy in Stroke Rehabilitation: Current Perspectives. Therapeutics & Clinical Risk Management 16: 75-85	- Systematic review used as source of primary studies
Gonzalez-Santos, J., Soto-Camara, R., Rodriguez-Fernandez, P. et al. (2020) Effects of home-based mirror therapy and cognitive therapeutic exercise on the improvement of the upper extremity functions in patients with severe hemiparesis after a stroke: a protocol for a pilot randomised clinical trial. BMJ Open 10(9): e035768	- Protocol
Hamzei, F, Lappchen, Ch, Glauche, V et al. (2012) Functional plasticity induced by mirror training: The mirror as the element connecting both hands to one hemisphere. Neurorehabilitation and Neural Repair 26(5): 484-96.	- Population not relevant to this review protocol *Healthy participants*
Harmsen, Wj, Bussmann, Jb, Selles, Rw et al. (2015) A mirror therapy-based action observation protocol to improve motor learning after stroke. Neurorehabilitation and Neural Repair 29(6): 509-16.	- Data not reported in an extractable format or a format that can be analysed
He, J, Li, C, Lin, J et al. (2022) Proprioceptive Training with Visual Feedback Improves Upper Limb Function in Stroke Patients: a Pilot Study. Neural plasticity 2022: 1588090	- Study does not contain an intervention relevant to this review protocol *Proprioceptive training with visual feedback but not mirror therapy*
Heo, S. Y., Lee, H. J., Ham, A. J. et al. (2016) The effects of virtual reality therapy on executive function and balance for stroke patients: a randomized controlled clinical trial. Journal of korean society of occupational therapy 24(4): 1-14	- Study not reported in English
Hsieh, Y. W. (2017) Comparative efficacy study of action observation therapy and mirror therapy after stroke.	- Trial registry only
Huang, X. (2016) Effects of Mirror therapy integrating neuromuscular electrical stimulation on motor recovery of lower-limbs and walking ability of stroke patients: a randomized, controlled trial.	- Trial registry only

Study	Code [Reason]
Inwald, G. (2018) Effects of virtual reality based rehabilitation in acute stroke patients in an inpatient rehab setting.	- Trial registry only
Jan, S., Arsh, A., Darain, H. et al. (2019) A randomized control trial comparing the effects of motor relearning programme and mirror therapy for improving upper limb motor functions in stroke patients. JPMA - Journal of the Pakistan Medical Association 69(9): 1242-1245	- Comparator in study does not match that specified in this review protocol
Ji, Sg, Cha, Hg, Kim, Mk et al. (2014) The effect of mirror therapy integrating functional electrical stimulation on the gait of stroke patients. Journal of Physical Therapy Science 26(4): 497-9.	- Duplicate reference
Jin, M., Zhang, Z., Bai, Z. et al. (2019) Timing-dependent interaction effects of tDCS with mirror therapy on upper extremity motor recovery in patients with chronic stroke: A randomized controlled pilot study. Journal of the Neurological Sciences 405: 116436	- Comparator in study does not match that specified in this review protocol
Jo, K; Yu, J; Jung, J (2012) Effects of virtual reality-based rehabilitation on upper extremity function and visual perception in stroke patients: A randomized control trial. Journal of Physical Therapy Science 24(11): 1205-8.	- Study does not contain an intervention relevant to this review protocol
Kang, S. H., Kim, D. K., Seo, K. M. et al. (2018) Modifying and evaluating efficacy of interactive computerized program using motion tracking technology to improve unilateral neglect in patients with chronic stroke. Medicine (United States) 97 (38)	- Study design not relevant to this review protocol
Kang, Sh, Kim, Dk, Seo, Km et al. (2009) A computerized visual perception rehabilitation programme with interactive computer interface using motion tracking technology a randomized controlled, single-blinded, pilot clinical trial study. Clinical Rehabilitation 23(5): 434-44.	- Study does not contain an intervention relevant to this review protocol
Karamians, R., Proffitt, R., Kline, D. et al. (2020) Effectiveness of Virtual Reality- and Gaming-Based Interventions for Upper Extremity Rehabilitation Poststroke: A Meta-analysis. Archives of Physical Medicine & Rehabilitation 101(5): 885-896	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Kim, Jh, Jang, Sh, Kim, Cs et al. (2009) Use of virtual reality to enhance balance and ambulation in chronic stroke: A double-blind, randomized controlled study. American Journal of Physical Medicine and Rehabilitation 88(9): 693-701.	- Study does not contain an intervention relevant to this review protocol
Kim, Sangjoon J., Han, Sang Yun, Yang, Gi-Hun et al. (2019) Development of an interactive game-based mirror image hand rehabilitation system. Intelligent Service Robotics 12(2): 149-157	- Study design not relevant to this review protocol
Kim, Y. J., Park, J. H., Jung, M. J. et al. (2017) The effects of task-based mirror therapy on upper extremity motor function and use in daily living in adults with stroke. Journal of korean society of occupational therapy 25(3): 41-57	- Study not reported in English
King, M. (2012) Randomised controlled trial of the Bilateral Upper Limb Trainer (BUiLT) + virtual reality for post-stroke upper limb rehabilitation.	- Trial registry only
Kiper, P., Szczudlik, A., Agostini, M. et al. (2018) Virtual Reality for Upper Limb Rehabilitation in Subacute and Chronic Stroke: A Randomized Controlled Trial. Archives of Physical Medicine & Rehabilitation 99(5): 834-842.e4	- Study does not contain an intervention relevant to this review protocol
Kojima, K. (2014) Clinical feasibility of mirror therapy combined with electromyography-triggered neuromuscular stimulation for paretic hand after stroke: a pilot randomized crossover trial.	- Study not reported in English
Kojima, K, Ikuno, K, Morii, Y et al. (2014) Feasibility study of a combined treatment of electromyography-triggered neuromuscular and mirror therapy in stroke: A randomized crossover trial. Neurorehabilitation 34(2): 235-44.	- Duplicate reference
Kurul, R. (2017) Effect of immersive virtual reality usage on upper extremity function in stroke patients.	- Trial registry only
Kwon, J. S. (2018) Therapeutic Intervention for Visuo-Spatial Neglect after Stroke: A Meta-Analysis of Randomized Controlled Trials.	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Osong Public Health & Research Perspectives 9(2): 59-65	
Lee Geller, D. (2018) Home Mirror Therapy: a Randomized Control Study Comparing Unimanual and Bimanual Mirror Therapy for Improved Arm and Hand Function Post-stroke. Dissertation/ thesis: 1-1	- Not a peer-reviewed publication *Thesis article reporting a randomised controlled trial published after the Cochrane review.*
Lee HJ; Kim YM; Lee DK (2017) The effects of action observation training and mirror therapy on gait and balance in stroke patients. Journal of physical therapy science 29(3): 523-526	- Comparator in study does not match that specified in this review protocol
Lee, S. H., Lee, J. Y., Kim, M. Y. et al. (2018) Virtual Reality Rehabilitation With Functional Electrical Stimulation Improves Upper Extremity Function in Patients With Chronic Stroke: A Pilot Randomized Controlled Study. Archives of Physical Medicine & Rehabilitation 99(8): 1447-1453.e1	- Study does not contain an intervention relevant to this review protocol
Lee, S. H., Park, J. S., Choi, J. B. et al. (2020) Improving upper extremity motor function in stroke patients using a complex task with multi-joint-based mirror therapy: A randomized controlled trial. Neurology Asia 25(3): 245-251	- Comparator in study does not match that specified in this review protocol
Lee, Sh (2019) Upper Extremity Rehabilitation for Stroke Patients Using Fully Immersive Virtual Reality Game :a Preliminary Study. Archives of Physical Medicine and Rehabilitation 100(10): e138-e139.	- Conference abstract
Lee, Y-C, Li, Y-C, Lin, K-C et al. (2022) Effects of robotic priming of bilateral arm training, mirror therapy, and impairment-oriented training on sensorimotor and daily functions in patients with chronic stroke: study protocol of a single-blind, randomized controlled trial. Trials 23(1)	- Protocol
Li, Y., Wei, Q., Gou, W. et al. (2018) Effects of mirror therapy on walking ability, balance and lower limb motor recovery after stroke: a systematic review and meta-analysis of randomized controlled trials. Clinical Rehabilitation 32(8): 1007-1021	- Systematic review used as source of primary studies
Lin, R. C., Chiang, S. L., Heitkemper, M. M. et al. (2020) Effectiveness of Early Rehabilitation Combined With Virtual Reality Training on	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Muscle Strength, Mood State, and Functional Status in Patients With Acute Stroke: A Randomized Controlled Trial. Worldviews on Evidence-Based Nursing 17(2): 158-167	
Lisa, Lp; Jughters, A; Kerckhofs, E (2013) The effectiveness of different treatment modalities for the rehabilitation of unilateral neglect in stroke patients: A systematic review. Neurorehabilitation 33(4): 611-20.	- Full text paper not available *Order cancelled (systematic review unlikely to be relevant)*
Liu, M., Xu, L., Li, H. et al. (2020) Morphological and functional changes of the tibialis anterior muscle following combined mirror visual feedback and electromyographic biofeedback in poststroke patients: A randomized trial. American Journal of Physical Medicine & Rehabilitation 22: 22	- Data not reported in an extractable format or a format that can be analysed
Louie, D. R.; Lim, S. B.; Eng, J. J. (2019) The Efficacy of Lower Extremity Mirror Therapy for Improving Balance, Gait, and Motor Function Poststroke: A Systematic Review and Meta-Analysis. Journal of Stroke & Cerebrovascular Diseases 28(1): 107-120	- Systematic review used as source of primary studies
Luo, Z., Zhou, Y., He, H. et al. (2020) Synergistic Effect of Combined Mirror Therapy on Upper Extremity in Patients With Stroke: A Systematic Review and Meta-Analysis. Frontiers in neurology [electronic resource]. 11: 155	- Systematic review used as source of primary studies
Malik, A. (2017) Effect of virtual reality on mobility in stroke in comparison with task oriented training P: stroke I: virtual reality training O= mobility C- task oriented training.	- Study design not relevant to this review protocol
Mao, H., Li, Y., Tang, L. et al. (2020) Effects of mirror neuron system-based training on rehabilitation of stroke patients. Brain and Behavior 10(8): e01729	- Study does not contain an intervention relevant to this review protocol
Margrett, C. M., Sri Thulasi, P. R., Prakash, P. K. et al. (2019) A Comparative Study on Mirror Therapy and Motor Imagery on Improving Gait in Post Stroke Subjects. Indian journal of physiotherapy & occupational therapy 13(2): 23-28	- Study design not relevant to this review protocol
McDonough, S. (2011) Virtual Reality in the Rehabilitation of the Upper Limb after stroke.	- Trial registry only

Study	Code [Reason]
Mekbib, D. B., Han, J., Zhang, L. et al. (2020) Virtual reality therapy for upper limb rehabilitation in patients with stroke: a meta-analysis of randomized clinical trials. Brain Injury 34(4): 456-465	- Study does not contain an intervention relevant to this review protocol
Melo, A. S. (2017) Virtual rehabilitation and PNF in the recovery of the motor function post stroke.	- Trial registry only
Merians, As, Jack, D, Boian, R et al. (2002) Virtual reality-augmented rehabilitation for patients following stroke. Physical Therapy 82(9): 898-915.	- Study does not contain an intervention relevant to this review protocol
Merians, As, Poizner, H, Boian, R et al. (2006) Sensorimotor training in a virtual reality environment: does it improve functional recovery poststroke?. Neurorehabilitation and Neural Repair 20(2): 252-67.	- Study does not contain an intervention relevant to this review protocol
Merians, As, Tunik, E, Fluet, Gg et al. (2009) Innovative approaches to the rehabilitation of upper extremity hemiparesis using virtual environments. Eur J Phys Rehabil Med 45(1): 123-33.	- Study design not relevant to this review protocol
Miclaus, R., Roman, N., Caloian, S. et al. (2020) Non-Immersive Virtual Reality for Post-Stroke Upper Extremity Rehabilitation: A Small Cohort Randomized Trial. Brain Sciences 10(9): 21	- Study does not contain an intervention relevant to this review protocol
Miclaus, R.S., Roman, N., Henter, R. et al. (2021) Lower extremity rehabilitation in patients with post-stroke sequelae through virtual reality associated with mirror therapy. International Journal of Environmental Research and Public Health 18(5): 1-14	- Data not reported in an extractable format or a format that can be analysed *Medians and interquartile ranges*
Mohammadi, R., Semnani, A. V., Mirmohammadkhani, M. et al. (2019) Effects of Virtual Reality Compared to Conventional Therapy on Balance Poststroke: A Systematic Review and Meta-Analysis. Journal of Stroke & Cerebrovascular Diseases 28(7): 1787-1798	- Study does not contain an intervention relevant to this review protocol
Monaghan, K and Simpson, D (2018) Unilateral strength training with and without a mirror to improve motor function after stroke: Past, present, and future. Physiotherapy Practice and Research 39(1): 1-4.	- Study design not relevant to this review protocol *Commentary only*

Study	Code [Reason]
Morkisch, N.; Thieme, H.; Dohle, C. (2019) How to perform mirror therapy after stroke? Evidence from a meta-analysis. Restorative Neurology & Neuroscience 37(5): 421-435	- Study does not contain an intervention relevant to this review protocol
Ng, Mj and Singh, P (2015) Mirror Therapy in Unilateral Neglect after Stroke (MUST trial): A randomized controlled trial. Neurology 84(12): 1286	- Secondary publication of an included study that does not provide any additional relevant information
Ng, S. (2018) Upper limb mirror therapy with TENS to improve upper limb functions in patients with sub-acute stroke.	- Trial registry only
Ng, S. (2018) Mirror therapy with cutaneous electrical sensory stimulation on lower limb motor functions in stroke.	- Duplicate reference
Novaes, Morgana M., Palhano-Fontes, Fernanda, Peres, Andre et al. (2018) Neurofunctional changes after a single mirror therapy intervention in chronic ischemic stroke. International Journal of Neuroscience 128(10): 966-974	- Study design not relevant to this review protocol
Ogun, M. N., Kurul, R., Yasar, M. F. et al. (2019) Effect of Leap Motion-based 3D Immersive Virtual Reality Usage on Upper Extremity Function in Ischemic Stroke Patients. Arquivos de Neuro-Psiquiatria 77(10): 681-688	- Study does not contain an intervention relevant to this review protocol
Ophelm, I and Bergfjord, J (2014) Stroke and mirror therapy. Fysioterapeuten 81(7): 16-20.	- Study not reported in English
Pagilla, V., Kumar, V., Joshua, A. et al. (2019) A top-down versus bottom-up approach to lower-extremity motor recovery and balance following acute stroke: A pilot randomized clinical trial. Critical Reviews in Physical and Rehabilitation Medicine 31(2): 135-146	- Comparator in study does not match that specified in this review protocol
Palacios-Navarro, G. and Hogan, N. (2021) Head-Mounted Display-Based Therapies for Adults Post-Stroke: A Systematic Review and Meta-Analysis. Sensors 21(4): 05	- Study does not contain an intervention relevant to this review protocol
Palma, G. C., Freitas, T. B., Bonuzzi, G. M. et al. (2017) Effects of virtual reality for stroke individuals based on the International	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Classification of Functioning and Health: a systematic review. Topics in Stroke Rehabilitation 24(4): 269-278	
Pandian, Jd, Arora, R, Kaur, P et al. (2014) Mirror Therapy in Unilateral Neglect After Stroke (MUST trial). Neurology 83(11): 1012-7.	- Duplicate reference
Perez-Cruzado, D., Merchan-Baeza, J. A., Gonzalez-Sanchez, M. et al. (2017) Systematic review of mirror therapy compared with conventional rehabilitation in upper extremity function in stroke survivors [with consumer summary]. Australian Occupational Therapy Journal 2017 Apr;64(2):91-112	- Duplicate reference
Perez-Cruzado, D., Merchan-Baeza, J. A., Gonzalez-Sanchez, M. et al. (2017) Systematic review of mirror therapy compared with conventional rehabilitation in upper extremity function in stroke survivors. Australian Occupational Therapy Journal 64(2): 91-112	- Systematic review used as source of primary studies
Perez-Marcos, D., Chevalley, O., Schmidlin, T. et al. (2017) Increasing upper limb training intensity in chronic stroke using embodied virtual reality: A pilot study. Journal of NeuroEngineering and Rehabilitation 14 (1)	- Study design not relevant to this review protocol
Pollock, A., Farmer, S. E., Brady, M. C. et al. (2014) Interventions for improving upper limb function after stroke (Cochrane review) [with consumer summary]. Cochrane Database of Systematic Reviews 2014;Issue 11	- Systematic review used as source of primary studies *Cochrane review. Includes parts of an older version of the Cochrane review updated for this review question. No additional studies. Includes a range of additional interventions that are not relevant to this review.*
Quaney, Bm, He, J, Timberlake, G et al. (2010) Visuomotor training improves stroke-related ipsilesional upper extremity impairments. Neurorehabilitation and Neural Repair 24(1): 52-61.	- Study does not contain an intervention relevant to this review protocol
Rajappan, R., Abudaheer, S., Selvaganapathy, K. et al. (2016) Effect of mirror therapy on hemiparetic upper extremity in subacute stroke patients. Indian journal of physical therapy 2(6): 1041-1046	- Duplicate reference

Study	Code [Reason]
Ramachandran, V. S. and Rogers-Ramachandran, D. (2019) Mirror feedback assisted recovery from hemiparesis following stroke. in Reply to Morkisch et al.: How to perform mirror therapy after stroke? Evidence from a meta-analysis. Restorative Neurology and Neuroscience 37(5): 437-443	- Study design not relevant to this review protocol *Editorial only*
Rodriguez-Hernandez, M., Criado-Alvarez, J. J., Corregidor-Sanchez, A. I. et al. (2021) Effects of Virtual Reality-Based Therapy on Quality of Life of Patients with Subacute Stroke: A Three-Month Follow-Up Randomized Controlled Trial. International Journal of Environmental Research & Public Health [Electronic Resource] 18(6): 10	- Study does not contain an intervention relevant to this review protocol
Rogers, J. M., Duckworth, J., Middleton, S. et al. (2019) Elements virtual rehabilitation improves motor, cognitive, and functional outcomes in adult stroke: evidence from a randomized controlled pilot study. Journal of Neuroengineering & Rehabilitation 16(1): 56	- Study does not contain an intervention relevant to this review protocol
Rossiter, He, Borrelli, Mr, Borchert, Rj et al. (2015) Cortical mechanisms of mirror therapy after stroke. Neurorehabilitation and Neural Repair 29(5): 444-52.	- Population not relevant to this review protocol
Rothgangel, As, Morton, Ar, van, den Hout Jw et al. (2004) Mirror therapy in stroke patients. Nederlands Tijdschrift fur Fysioterapie 114(2): 36-40.	- Study not reported in English
Rowe, Vt, Halverson, M, Wilbanks, L et al. (2019) Perception of task realism in mirror therapy activities for the upper extremity. British Journal of Occupational Therapy 82(11): 685-92.	- Study design not relevant to this review protocol
Rutkowski, S., Kiper, P., Cacciante, L. et al. (2020) Use of virtual reality-based training in different fields of rehabilitation: A systematic review and meta-analysis. Journal of Rehabilitation Medicine 52(11): jrm00121	- Systematic review used as source of primary studies
Saavedra-Garcia, A.; Moral-Munoz, J. A.; Lucena-Anton, D. (2021) Mirror therapy simultaneously combined with electrical stimulation for upper limb motor function recovery after stroke: a systematic review and	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
meta-analysis of randomized controlled trials. Clinical Rehabilitation 35(1): 39-50	
Sale, P and Franceschini, M (2012) Action observation and mirror neuron network: A tool for motor stroke rehabilitation. European Journal of Physical and Rehabilitation Medicine 48(2): 313-8.	- Study design not relevant to this review protocol *Commentary only*
Saleh, S; Adamovich, Sv; Tunik, E (2014) Mirrored feedback in chronic stroke: Recruitment and effective connectivity of ipsilesional sensorimotor networks. Neurorehabilitation and Neural Repair 28(4): 344-54.	- Study design not relevant to this review protocol
Schuster-Amft, C., Eng, K., Suica, Z. et al. (2018) Effect of a four-week virtual reality-based training versus conventional therapy on upper limb motor function after stroke: A multicenter parallel group randomized trial. PLoS ONE [Electronic Resource] 13(10): e0204455	- Study does not contain an intervention relevant to this review protocol
Selles, Rw, Michielsen, Me, Bussmann, Jb et al. (2014) Effects of a mirror-induced visual illusion on a reaching task in stroke patients: Implications for mirror therapy training. Neurorehabilitation and Neural Repair 28(7): 652-9.	- Before date limitation
Shaker, H., Fahmy, E. M., Honin, A. A. N. et al. (2020) Effect of mirror therapy on hand functions in Egyptian chronic stroke patients. Egyptian Journal of Neurology, Psychiatry and Neurosurgery 56 (1)	- Study design not relevant to this review protocol
Sheehy, L., Taillon-Hobson, A., Sveistrup, H. et al. (2020) Sitting Balance Exercise Performed Using Virtual Reality Training on a Stroke Rehabilitation Inpatient Service: A Randomized Controlled Study. Pm & R 12(8): 754-765	- Study does not contain an intervention relevant to this review protocol
Sheehy, L., Taillon-Hobson, A., Sveistrup, H. et al. (2019) Home-based virtual reality training after discharge from hospital-based stroke rehabilitation: a parallel randomized feasibility trial. Trials [Electronic Resource] 20(1): 333	- Study does not contain an intervention relevant to this review protocol - Protocol
Simpson, D. (2018) Unilateral strength training and mirror therapy for chronic stroke patients.	- Trial registry only

Study	Code [Reason]
Standen, P. J., Threapleton, K., Richardson, A. et al. (2017) A low cost virtual reality system for home based rehabilitation of the arm following stroke: a randomised controlled feasibility trial. Clinical Rehabilitation 31(3): 340-350	- Study does not contain an intervention relevant to this review protocol
Standen, Pj, Threapleton, K, Connell, L et al. (2015) Patients' use of a home-based virtual reality system to provide rehabilitation of the upper limb following stroke. Physical Therapy 95(3): 350-9.	- Study does not contain an intervention relevant to this review protocol
Subramanian, S. K.; Cross, M. K.; Hirschhauser, C. S. (2020) Virtual reality interventions to enhance upper limb motor improvement after a stroke: commonly used types of platform and outcomes. Disability and rehabilitation assistivetechnology: 1-9	- Study does not contain an intervention relevant to this review protocol
Subramanian, Sk, Lourenco, Cb, Chilingaryan, G et al. (2013) Arm motor recovery using a virtual reality intervention in chronic stroke: Randomized control trial. Neurorehabilitation and Neural Repair 27(1): 13-23.	- Study does not contain an intervention relevant to this review protocol
Sugg, K, Muller, S, Winstein, C et al. (2015) Does action observation training with immediate physical practice improve, hemiparetic upper-limb function in chronic stroke?. Neurorehabilitation and Neural Repair 29(9): 807-17.	- Study does not contain an intervention relevant to this review protocol
Sun (2015) The clinical study of motor function recovery of cerebral infarction patients with mirror exercise therapy. Chin J Neuroimmunol Neurol 22: 146-147	- Full text paper not available
Tanabe, J. and Morishita, M. (2021) Effects of Action Observation Therapy with Limited Visual Attention on Walking Ability in Stroke Patients. Journal of motor behavior: 1-10	- Study does not contain an intervention relevant to this review protocol
Thieme, H., Morkisch, N., Rietz, C. et al. (2016) The efficacy of movement representation techniques for treating limb pain -- a systematic review and metaanalysis [with consumer summary]. The Journal of Pain 2016 Feb;17(2):167-180	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Viana, Rt, Laurentino, Ge, Souza, Rj et al. (2014) Effects of the addition of transcranial direct current stimulation to virtual reality therapy after stroke: A pilot randomized controlled trial. Neurorehabilitation 34(3): 437-46.	- Study does not contain an intervention relevant to this review protocol - Comparator in study does not match that specified in this review protocol
Vourvopoulos, Athanasios, Pardo, Octavio Marin, Lefebvre, Stéphanie et al. (2019) Effects of a brain-computer interface with virtual reality (VR) neurofeedback: A pilot study in chronic stroke patients. Frontiers in Human Neuroscience 13: 17	- Study does not contain an intervention relevant to this review protocol
Wang, J, Fritzsch, C, Bernarding, J et al. (2013) Cerebral activation evoked by the mirror illusion of the hand in stroke patients compared to normal subjects. Neurorehabilitation 33(4): 593-603.	- Full text paper not available *Order cancelled - Included healthy participants*
Wiley, E.; Khattab, S.; Tang, A. (2020) Examining the effect of virtual reality therapy on cognition post-stroke: a systematic review and meta-analysis. Disability & Rehabilitation Assistive Technology: 1-11	- Study does not contain an intervention relevant to this review protocol
Wittenberg, Gf, Bastian, Aj, Dromerick, Aw et al. (2000) Mirror movements complicate interpretation of cerebral activation changes during recovery from subcortical infarction. Neurorehabilitation and Neural Repair 14(3): 213-21.	- Study design not relevant to this review protocol
Wu, C. Y. (2020) Robot-assisted therapy combined with mirror priming in upper limb training in stroke.	- Trial registry only
Wu, C. Y. and Chen, C. L. (2020) Effects of combined robot-assisted therapy with mirror priming in stroke patients.	- Trial registry only
Yamato, Tp, Pompeu, Je, Pompeu, Sm et al. (2016) Virtual reality for stroke rehabilitation. Physical Therapy 96(10): 1508-13.	- Study does not contain an intervention relevant to this review protocol *Cochrane review. Discusses virtual reality therapy.*
Yang, Y., Zhao, Q., Zhang, Y. et al. (2018) Effect of Mirror Therapy on Recovery of Stroke	- Systematic review used as source of primary studies

Study	Code [Reason]
Survivors: A Systematic Review and Network Meta-analysis. Neuroscience 390: 318-336	
Yao, X., Cui, L., Wang, J. et al. (2020) Effects of transcranial direct current stimulation with virtual reality on upper limb function in patients with ischemic stroke: a randomized controlled trial. Journal of Neuroengineering & Rehabilitation 17(1): 73	- Study does not contain an intervention relevant to this review protocol - Comparator in study does not match that specified in this review protocol
Yao, X. and Xie, Q. (2018) Effects of virtual reality combined with transcranial direct current stimulation on upper limb function in patients with ischemic stroke.	- Trial registry only
Yeh, Sc, Lee, Sh, Chan, Rc et al. (2014) A virtual reality system integrated with robot-assisted haptics to simulate pinch-grip task: Motor ingredients for the assessment in chronic stroke. Neurorehabilitation 35(3): 435-49.	- Study does not contain an intervention relevant to this review protocol
Yumi, J. U. and In-Jin, Y. (2018) The effects of modified constraint-induced movement therapy and mirror therapy on upper extremity function and its influence on activities of daily living. Journal of physical therapy science 30(1): 77-81	- Study design not relevant to this review protocol
Zeng, W., Guo, Y., Wu, G. et al. (2018) Mirror therapy for motor function of the upper extremity in patients with stroke: A meta-analysis. Journal of Rehabilitation Medicine 50(1): 8-15	- Systematic review used as source of primary studies
Zhang, B., Li, D., Liu, Y. et al. (2021) Virtual reality for limb motor function, balance, gait, cognition and daily function of stroke patients: A systematic review and meta-analysis. Journal of Advanced Nursing 06: 06	- Study does not contain an intervention relevant to this review protocol
Zhang, X. and Zhang, Y. (2019) Effectiveness of mirror therapy on mood in stroke patients.	- Trial registry only
Zhang, Y., Zhang, W., Xing, B. et al. (2019) Mirror therapy versus action observation therapy: Effects on excitability of the cerebral cortex in patients after strokes. International Journal of Clinical and Experimental Medicine 12(7): 8763-8772	- Comparator in study does not match that specified in this review protocol

Study	Code [Reason]
Zhu, M. H., Zeng, M., Shi, M. F. et al. (2020) Visual feedback therapy for restoration of upper limb function of stroke patients. International Journal of Nursing Sciences 7(2): 170-178	- Study does not contain an intervention relevant to this review protocol
Zondervan, Dk, Augsburger, R, Bodenhoefer, B et al. (2015) Machine-based, self-guided home therapy for individuals with severe arm, impairment after stroke: A randomized controlled trial. Neurorehabilitation and Neural Repair 29(5): 395-406.	- Study does not contain an intervention relevant to this review protocol
Zult, T., Goodall, S., Thomas, K. et al. (2016) Mirror Training Augments the Cross-education of Strength and Affects Inhibitory Paths. Medicine & Science in Sports & Exercise 48(6): 1001-13	- Population not relevant to this review protocol

Health Economic studies

Published health economic studies that met the inclusion criteria (relevant population, comparators, economic study design, published 2006 or later and not from non-OECD country or USA) but that were excluded following appraisal of applicability and methodological quality are listed below. See the health economic protocol for more details.

Table 7: Studies excluded from the health economic review

Reference	Reason for exclusion
None	

Appendix K – Research recommendations – full details

K.1 Research recommendation

Which groups of people benefit from mirror therapy after a stroke?

K.1.1 Why this is important

Following a stroke the prevalence of upper or lower limb impairment is high. This can negatively impact health related quality of life and independence in activities of daily living. Mirror therapy involves using a mirror to create an illusion that the affected limb is moving and aims to stimulate different regions of the brain. Currently its use varies across NHS trusts and there is no formal guidance in place. This evidence review showed that mirror therapy can lead to improvements in activities of daily living, visuospatial neglect and upper limb motor function. This led to the committee making a positive recommendation for mirror therapy for people with upper or lower limb impairment. However, all of the included evidence reported a range of inclusion criteria and study populations. Therefore, the committee agreed it was important to find out who would benefit most from this form of therapy in order to make therapy more targeted and patient centred.

K.1.2 Rationale for research recommendation

Importance to 'patients' or the population	Upper and lower limb impairment is common post stroke and can greatly impact the stroke survivor's health-related quality of life, mobility, independence and activities of daily living. Some people may benefit from this form of therapy more than others and it is important not to waste valuable therapy time engaging in an intervention that may be ineffective for that specific population. Therefore, further research into who could benefit the most from this therapy is important and will help make treatment more patient centred.
Relevance to NICE guidance	Mirror therapy has been shown to be effective for improving several clinical outcomes. However, due to the heterogenous nature of the evidence it is unclear which patient groups particularly benefit from this therapy. In order to ensure cost effectiveness and optimise the use of therapy time it is important to establish if there are any specific populations who would benefit from mirror therapy. This research will help to make the NICE guidance relevant and individualised to patient needs.
Relevance to the NHS	Use of mirror therapy in the NHS varies between trusts and there is currently no set guidance on how this should be delivered. Use of mirror therapy will likely increase as a result of this NICE guidance. Therefore, it is important that therapy time is not wasted delivering this intervention to patient groups who may not experience clinical benefits. Further research is required to explore which patient populations will particularly benefit from this intervention to ensure treatments are patient centred and cost effective.

National priorities	None identified.
Current evidence base	This review reported that mirror therapy is effective for improving activities of daily living, upper limb function and visuospatial neglect. However, due to the heterogenous evidence base research to show whether certain groups of the population will benefit more than others would be useful to help target the therapy better.
Equality considerations	No specific equality considerations were identified. The committee noted that in general throughout the guideline, people with communication and cognitive difficulties, older people and people who have had a previous stroke or transient ischaemic attack were excluded from trials but are people that the guideline is for. Therefore, research should aim to include these people where possible.

K.1.3 Modified PICO table

Population	Inclusion: • Adults (age ≥16 years) who have had a first or recurrent stroke Subgroup analyses by specific population factors (see additional information). Exclusion: • Children (age <16 years) • People who have had a transient ischaemic attack
Intervention	• Mirror therapy
Comparator	• Sham therapy/placebo or usual care
Outcome	• Person/participant generic health-related quality of life • Carer generic health-related quality of life • Upper limb and hand motor function • Lower limb motor function • Fugl-Meyer Assessment Upper Extremity • Measures of motor impairment • Activities of daily living • Pain • Visuospatial neglect • Stroke-specific Patient-Reported Outcome Measures • Adverse events
Study design	Randomised controlled trial
Timeframe	6 months
Additional information	Subgroup analyses: • Severity (NIHSS mild, moderate, severe, very severe)

	• Chronicity (Acute/Subacute or Chronic) • Type of stroke using the Bamford scale (TACS, PACS, LACS, POCS) • Limb therapy is used for (Upper limb, lower limb)