National Institute for Health and Care Excellence

Draft for consultation

Stroke rehabilitation in adults (update)

[N] Evidence reviews for the clinical and cost-effectiveness of music therapy for adults after a stroke

NICE guideline GID-NG10175

Evidence reviews underpinning research recommendations in the NICE guideline

April 2023

Draft for Consultation

These evidence reviews were developed by the Guideline Development Team at NICE

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1 Music therapy

1.1 Review question

In people after stroke, what is the clinical and cost effectiveness of music therapy to improve mood and activities of daily living?

1.1.1 Introduction

Music activates a wide range of regions within the brain including networks involved in speech, motor function and cognition. Music therapy aims to facilitate recovery mechanisms in the brain to enhance rehabilitation and overall improvements.

Usually trained music therapists deliver it with an individual or in a group. Music is used in a number of different ways; for example listening to music, actively participating in music or writing and composing music.

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 stroke or recurrent stroke (including people after a subarachnoid haemorrhage) Exclusion: • Children (age <16 years) • People who have had a transient ischaemic attack
Interventions	• Neurologic music therapy delivered by trained music therapists • Music therapy delivered by trained music therapists • Music interventions delivered by healthcare professionals • Music interventions delivered by non-healthcare professionals The interventions will be analysed as separate stratifications.
Comparisons	• Compared to each other • Passive music listening (for example: music played in the background) • Placebo music therapy • No treatment Each comparator will be analysed in separate stratifications by different types of comparators.
Outcomes	All outcomes are considered equally important for decision making and therefore have all been rated as critical: At time period • <6 months • ≥6 months • 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])

	• Activities of daily living (continuous outcomes will be prioritised)
	• Psychological distress (continuous outcomes will be prioritised)
	  ○ Depression
	  ○ Anxiety
	  ○ Distress
	• Stroke-specific Patient-Reported Outcome Measures (continuous outcomes will be prioritised)
	• Wellbeing scores (continuous outcomes will be prioritised)
	• Participation in leisure activities/social groups scores (continuous outcomes will be prioritised)
	• Withdrawal due to adverse events (dichotomous outcome)

Study design	• Systematic reviews of RCTs • Parallel RCTs • Cluster randomised crossover trials (unit of randomisation = unit [for example: hospital, community location]) If there is insufficient randomised trial evidence, non-randomised studies (prospective and retrospective cohort trials) will be considered after discussion with the committee.

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

Twenty one randomised controlled trials (twenty three papers) were included in the review;[2, 4-12, 15-27] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary below (Table 3).

The studies included the following comparisons:

- Neurologic music therapy delivered by trained music therapists compared to no treatment[17, 26]
- Music therapy delivered by trained music therapists compared to no treatment[4, 5, 9, 10, 15, 16, 19]
- Music intervention delivered by healthcare professionals compared to passive music listening[2]
- Music intervention delivered by healthcare professionals compared to placebo music therapy[2]
- Music intervention delivered by healthcare professionals compared to no treatment[6-8, 11, 12, 18, 22-25, 27]
- Music intervention delivered by non-healthcare professionals compared to no treatment[20, 21]

While comparisons were available for each intervention category compared to no treatment, there was limited or no evidence comparing therapies to:

- Each other
- Passive music listening
- Placebo music therapy

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.

1.1.4.1.1 Types of intervention

The types of interventions delivered in the studies varied. They included:

- Rhythmic auditory cueing[4, 7, 8, 12, 22, 23, 25]
- Interventions where musical instruments are played (including clinical improvisation)[5, 6, 10, 16, 19]
- Receptive interventions in which participants listen to music[2, 11, 17, 27]
- Singing a music-based voice interventions[20, 26]
- Sonofication[18]
- Combinations of the above[9, 15]

Where heterogeneity was present there was an insufficient number of studies in each group representing different types of intervention, and so the heterogeneity was not resolved by subgroup analysis by these groups.

1.1.4.2 Excluded studies

One Cochrane review was identified that included relevant information for this review, Magee 2017[13]. This review was excluded as it included people with conditions other than stroke (including any acquired brain injury). While the review was excluded, the references were checked for studies relevant for this review.

A significant number of studies were excluded as they did not report outcomes relevant to the protocol, the majority of these reporting outcomes relevant to individual impairments (for example: motor function, communication). These outcomes were considered of a lower priority than functional outcomes (for example: activities of daily living) and were considered through other outcomes (for example: health-related quality of life).

See the excluded studies list in Appendix J.

1.1.5 Summary of studies included in the effectiveness evidence

1.1.5.1 Neurologic music therapy delivered by trained music therapists

Table 2: Summary of studies included in the evidence review

Study	Intervention and comparison	Population	Outcomes	Comments
Pocwierz-Marciniak 2017[17]	**Neurologic music therapy delivered by trained music therapists** (n=30) One-to-one sessions using mainly a receptive approach based on cognitive music therapy and guided imagery and music. Twice a week for 10 meetings. Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Receptive interventions in which participants listen to music **No treatment** (n=31) No listening materials **Concomitant therapy** All people were undergoing an inpatient neurological rehabilitation in hospital and receiving standard care, including physiotherapy, ergotherapy,	**Adults who have had a first stroke** Mean age (range): 64 (44 to 84) years N=61 Time after stroke: Acute (72 days - 7 days) – not explicitly stated Severity: Not stated/unclear Type of stroke: Ischaemic = 49 Haemorrhagic = 12	Person/participant generic health-related quality of life at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months	Setting: Inpatient neurological rehabilitation in hospital in Gdynia (Northern Poland). Funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	psychological diagnosis and maintenance psychotherapy.			
Zhang 2021[26]	**Neurologic music therapy delivered by trained music therapists** (n=20) Melodic intonation therapy for 30 minutes per session, five sessions a week for 8 weeks. Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Singing and music-based voice interventions **No treatment** (n=20) Usual care by a speech therapist for the same amount of time. **Concomitant therapy** All patients underwent routine treatment during the study period, including taking medication and other care and support.	**Adults who have had a first stroke** Mean age (SD): 53.5 (10.0) years N=61 Time after stroke: 2.27 (1.59) months Severity: Mixed Type of stroke: Ischaemic = 24 Haemorrhagic = 16	Psychological distress (depression) at <6 months Psychological distress (anxiety) at <6 months	Setting: Inpatient care in China. Funding: Funded by a governmental/non-for-profit research grant.

1 **1.1.5.2 Music therapy delivered by trained music therapists**

2 **Table 3: Summary of studies included in the evidence review**

Study	Intervention and comparison	Population	Outcomes	Comments
Cha 2014[4]	**Music therapy delivered by trained music therapists** (n=10) Intensive gait training with rhythmic auditory	**Adults who have had a first or recurrent stroke** Mean age (SD): 61.4 (13.1) years N = 20	Stroke-specific Patient-Reported Outcome Measures at <6 months	Setting: Outpatient follow up in the Republic of Korea Funding: This study was supported by S University (2013)

Study	Intervention and comparison	Population	Outcomes	Comments
	stimulation for 30 minutes, five days per week. Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Rhythmic auditory cueing **No treatment** (n=10) Intensive gait training only. **Concomitant therapy** All participants received general physical therapy, including Bobath approach and proprioceptive neuromuscular facilitation for 30 minutes per day, five days per week.	Time after stroke (SD): 14.6 (5.5) years Severity: Not stated/unclear Type of stroke: Not stated/unclear	Withdrawal due to adverse events at <6 months	
Fujioka 2018[5]	**Music therapy delivered by trained music therapists** (n=14) Music-supported therapy added to support motor, cognitive and psychosocial functions combined with an existing conventional physical training programme (GRASP) Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Interventions where musical instruments are played (including	**Adults who have had a first or recurrent stroke** Mean age (SD): 59.4 (11.5) years N = 29 Time after stroke (SD): 5.4 (6.7) years Severity: Not stated/unclear Type of stroke: Not stated/unclear	Psychological distress (depression and other) at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months Withdrawal due to adverse events at <6 months	Setting: Outpatient follow up in Canada Funding: This research was supported by the Canadian Institutes of Health Research and the Heart and Stroke Foundation Ontario.

Study	Intervention and comparison	Population	Outcomes	Comments
	clinical improvisation) **No treatment** (n=15) Conventional physical training programme (GRASP) without music **Concomitant therapy** No additional information			
Jun 2013[9]	**Music therapy delivered by trained music therapists** (n=20) Music movement therapy including 20 minutes of preparatory activities, 30 minutes of main activities and 10 minutes of finishing activities delivered 3 times per week for 8 weeks. Group/individual sessions: Group Hospital/community: Hospital Type of intervention: Any combination of the above (interventions where musical instruments are played and receptive interventions in which participants listen to music) **No treatment** (n=20) Routine treatment only **Concomitant therapy**	**Adults who have had a first or recurrent stroke** Mean age (SD): 57.9 (13.9) years N = 40 Time after stroke: Acute (72 hours – 7 days) – not explicitly stated Severity: Not stated/unclear Type of stroke: Infarction = 25 Haemorrhage = 5	Activities of daily living at <6 months Psychological distress (depression) at <6 months	Quasi-experimental trial but states it was randomised. Has been included but downgraded for risk of selection bias. Setting: Hospital inpatients in South Korea Funding: This work was supported by Dong-eui University Foundation Grant (2011).

Study	Intervention and comparison	Population	Outcomes	Comments
	No additional information			
Kim 2011[10]	**Music therapy delivered by trained music therapists** (n=9) Music therapy program following a standard 40-minute format carried out in accordance with the physical strength and individual characteristics of patients for 4 weeks Group/individual sessions: Not stated/unclear Hospital/community : Hospital Type of intervention: Interventions where music instruments are played (including clinical improvisation) **No treatment** (n=9) No music intervention **Concomitant therapy** All people received comprehensive rehabilitation treatment including physiotherapy, occupational therapy or speech therapy. All people received regular counselling by a licensed psychotherapist.	**Adults who have had a first or recurrent stroke** Mean age (SD): 49.5 (12.8) years N = 18 Time after stroke: Subacute (7 days – 6 months) – not explicitly stated Severity: Not stated/unclear Type of stroke: Not stated/unclear	Psychological distress (depression and anxiety) at <6 months Withdrawal due to adverse events at <6 months	Setting: Inpatient setting in South Korea Funding: The authors have no financial conflicts of interest
Nayak 2000[15]	**Music therapy delivered by trained music therapists** (n=10) Music therapy 3 treatments per	**Adults with acute brain injury (including people after a first or recurrent stroke)**	Psychological distress (depression) at <6 months Participation in leisure	Setting: Inpatient facility at the Kessler Institute for Rehabilitation in the United States of America

Study	Intervention and comparison	Population	Outcomes	Comments
	week for up to 10 treatments (treatment two or three times per week). A variety of procedures were used based on the needs of the person. Group/individual sessions: Group Hospital/community : Hospital Type of intervention: Any combination of the above (combination of musical instruments, singing and songwriting) **No treatment** (n=8) Standard rehabilitation. **Concomitant therapy** Conventional rehabilitation was provided to both groups.	Mean age (SD): 59.9 (16.3) years N = 18 Time after stroke: Acute (72 hours – 7 days) – not explicitly stated Severity: Not stated/unclear Type of stroke: Not stated/unclear	activities/social groups at <6 months Withdrawal due to adverse events at <6 months	Funding: Support for this research was provided by National Institutes of Health Grant U24-HD32994 The proportion of participants after stroke was unclear. Due to this the study was included but downgraded for population indirectness.
Palumbo 2022[16]	**Music therapy delivered by trained music therapists** (n=15) Music therapy integrated with upper limb exercise using liver, interactive music making using a Nordoff-Robbins approach. For 45 minutes, twice a week for 6 weeks. Group/individual sessions: Group Hospital/community : Hospital Type of intervention: Interventions where	**Adults with acute brain injury (including people after a first or recurrent stroke)** Mean age (SD): 61.5 (11.1) years N = 30 Time after stroke: Subacute (7 days - 6 months) Severity: Not stated/unclear Type of stroke: Not stated/unclear	Psychological distress (depression) at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months	Setting: Outpatient follow-up in the United States of America. Funding: Supported by New York University Clinical Translational Science Award UL1TR000038 from the National Center for Advancing Translational Sciences (NCATS) and U54NS081765, National Institutes of Health, and in part by grants from the GRAMMY Foundation and the John and Jennifer Clay Foundation.

Study	Intervention and comparison	Population	Outcomes	Comments
	musical instruments are played (including clinical improvisation) **No treatment** (n=15) Home exercise programme for a matched amount of time. **Concomitant therapy** No additional information.			The control group intervention may have received exercise that was of greater intensity than that received by the intervention group and so was downgraded for comparator indirectness.
Raglio 2017[19]	**Music therapy delivered by trained music therapists** (n=19) Relational active music therapy approach using rhythmical-melodic instrumentation. 20 sessions lasting 30 minutes each, three weekly. Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Interventions where musical instruments are played (including clinical improvisation) **No treatment** (n=19) No music intervention **Concomitant therapy** The standard of care treatment consisted of daily sessions of physiotherapy (passive/assisted	**Adults who have had a first or recurrent stroke** Mean age (SD): 63.6 (13.1) years N = 38 Time after stroke (median [IQR]): Intervention – 29.5 (31.8) days Control – 34.5 (38.3) days Severity (NIHSS – mean [SD]): 4.8 (2.3) Type of stroke: Ischaemic = 35 Haemorrhagic = 3	Patient/participant generic health-related quality of life at <6 months Activities of daily living at <6 months Psychological distress (depression and anxiety) at <6 months	Setting: Inpatients in Italy Funding: The authors received no financial support for the research, authorship, and/or publication of this article.

Study	Intervention and comparison	Population	Outcomes	Comments
	active mobilization and neurorehabilitative techniques of paretic upper limbs, coordination and balance exercises, and gait training) and occupational therapy (exercises improving fine motor skills and recovering activities of daily living).			

1 ### 1.1.5.3 Music interventions delivered by healthcare professionals

2 **Table 4: Summary of studies included in the evidence review**

Study	Intervention and comparison	Population	Outcomes	Comments
Baylan 2016[2]	**Music interventions delivered by healthcare professionals** (n=23) Mindful music listening. People were given an iPod Nano (7th Generation, Apple Inc.) and asked to listen to their material daily on their own for at least an hour during the intervention phase (target 56 hours over 8 consecutive weeks). Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Receptive interventions in which participants listen to music **Passive music listening** (n=24)	**Adults who have had a first or recurrent stroke** Mean age (SD): 64.0 (11.8) years N = 72 Time after stroke (median): 19 days Severity: Not stated/unclear Type of stroke: Cortical = 46 Subcortical = 26	Psychological distress (depression and anxiety) at <6 months Participation in leisure activities/social groups scores at <6 months Withdrawal due to adverse events at <6 months	Setting: Acute Stroke Units within NHS Greater Glasgow and Clyde, United Kingdom Funding: This work was supported by the Dunhill Medical Trust, grant R432/0214. Additional support from Scottish Executive Chief Scientist Office (TQ/BC), Stroke Association (TQ) and The Dr Mortimer and Theresa Sackler Foundation (BC/SB).

Study	Intervention and comparison	Population	Outcomes	Comments
	Listening to music without any mindfulness components. **Placebo music therapy** (n=25) Audiobook listening instead of music listening. **Concomitant therapy** No additional information			
Grau-Sanchez 2018[6]	**Music interventions delivered by healthcare professionals** (n=20) Music supported therapy delivered by an occupational therapists and physiotherapist. 20 individual sessions (5 sessions per week, 30 minutes each). Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Interventions where musical instruments are played (including clinical improvisation) **No treatment** (n=20) Additional individual training of the upper extremity. 20 individual sessions (5 sessions per week, 30 minutes each) consisting of passive mobilization,	**Adults who have had a first or recurrent stroke** Mean age (range): 61.3 (45-74) years N = 40 Time after stroke (range): 65.4 (28-162) days Severity (NIHSS – mean [range]): 5.4 (2-14) Type of stroke: Not stated/unclear	Patient/participant generic health-related quality of life at <6 months Psychological distress (depression and other) at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months Withdrawal due to adverse events at <6 months	Setting: Outpatient follow up. Rehabilitation delivered in hospital setting in Spain. Funding: This work was supported by the Spanish Government (Ministerio de Econom´ıa y Competitivdad, PSI2015-69178-P, Fondo Europeo de Desarrollo Regional (FEDER)).

Study	Intervention and comparison	Population	Outcomes	Comments
	stretch and progressive resistance exercises, and task-specific training. **Concomitant therapy** Both groups received an outpatient rehabilitation program that consisted of two 1 hour group sessions of occupational therapy and physiotherapy a day (5 days per week, 10 hours in total per week).			
Hill 2011[7]	**Music interventions delivered by healthcare professionals** (n=6) Interactive metronome intervention delivered by an occupational therapist. Completing the same exercises as the occupational therapy only group, with an additional 30 minute interactive metronome session. 1 hour treatment, 3 times a week for 10 weeks. Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Rhythmic auditory cueing	**Adults who have had a first or recurrent stroke** Mean age (SD): 60.0 (9.2) years N = 10 Time after stroke (SD): 3.3 (2.3) years Severity: Not stated/unclear Type of stroke: Not stated/unclear.	Activities of daily living at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months Withdrawal due to adverse events at <6 months	Setting: Outpatient follow up. Delivered in hospital setting in the United States of America. Funding: Interactive Metronome equipment and software provided for the study.

Study	Intervention and comparison	Population	Outcomes	Comments
	No treatment (n=4) Usual occupational therapy only. 1 hour treatment, 3 times a week for 10 weeks. **Concomitant therapy** Usual occupational therapy including prefunctional activities, functional activities and COPM (Canadian Occupational Performance Measure) tasks.			
Jeong 2007[8]	**Music interventions delivered by healthcare professionals** (n=16) Rhythmic auditory stimulation music-movement program for 2 hours/week for 8 weeks Group/individual sessions: Group Hospital/community : Community Type of intervention: Rhythmic auditory cueing **No treatment** (n=17) Received referral information about available usual care services (available to both groups) **Concomitant therapy** No additional information.	**Adults who have had a first or recurrent stroke** Mean age (SD): 60.2 (8.0) years N = 33 Time after stroke (SD): 6.4 (5.0) years Severity: Not stated/unclear Type of stroke: Not stated/unclear	Psychological distress (other) at <6 months Stroke-specific Patient-Reported Outcome Measures at <6 months	Setting: A neighbourhood community health center located in the metropolitan area in Seoul, South Korea. Funding: This study was supported by the BK21 project (Grant No. 0522-20010002), the Korea Science and Engineering Foundation (Grant No. R04-2001-000-00197-0), and the Research Institute of Nursing Science at Seoul National University.
Lin 2017[11]	**Music interventions delivered by**	**Adults who have had a first or recurrent stroke**	Activities of daily living at <6 months	Setting: Inpatients and China

Study	Intervention and comparison	Population	Outcomes	Comments
	healthcare professionals (n=30) Acupuncture with a five phase music therapy intervention. Music therapy was administered twice daily, once in the morning and once in the afternoon for 20 minutes per session. All treatments were administered in a 5 day cycle, for three continuous cycles with an interval between two cycles of 1 day (17 days in total). Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Receptive interventions in which participants listen to music **No treatment** (n=30) Acupuncture needling only for the same timings. A third arm was reported (n=32) that received 50mg sertraline hydrochloride only. This group was not included in the analysis as it did not fulfil the criteria of the protocol. **Concomitant therapy** No additional information	Mean age (SD): 70.3 (11.3) years N = 92 Time after stroke: Subacute (7 days – 6 months) – not explicitly stated Severity: Not stated/unclear Type of stroke: No additional information	Psychological distress (depression) at <6 months Withdrawal due to adverse events at <6 months	Funding: State Administration of Traditional Chinese Medicine of the People's Republic of China, State Clinical Research Base of Traditional Chinese Medicine, The Second Batch of Professional Skill Scientific and Research Special Project (No. JDZX2015127); Jiangsu Natural Science Foundation Youth Project (No. BK20171070); Nanjing Scientific Development Planned Project (No. 201402057)

Study	Intervention and comparison	Population	Outcomes	Comments
Luft 2004[12]	**Music interventions delivered by healthcare professionals** (n=11) Bilateral arm training with rhythmic auditory cueing in hour long therapy sessions (four 5 minute movement periods with 10 minute rest periods between) 3 times per week for 6 weeks. Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Rhythmic auditory cueing **No treatment** (n=15) Dose matched therapeutic exercise (same timings). **Concomitant therapy** No additional information	**Adults who have had a first or recurrent stroke** Mean age (SD): 61.2 (12.9) years N = 26 Time after stroke (median [IQR]): Intervention – 75 (37.9-84.5) months Control: 45.5 (22.6-66.3) months Severity: Not stated/unclear Type of stroke: Cortical = 12 Subcortical = 6 Brainstem = 3	Activities of daily living at <6 months	Setting: Outpatient rehabilitation care in hospital in the United States of America Funding: This study was funded by National Institutes of Health grants from the National Institute on Aging (P60AG 12583); University of Maryland Claude D. Pepper Older Americans Independence Center, National Institute on Disability and Rehabilitation Research (H133G010111); the Baltimore Department of Veterans Affairs Geriatrics Research, Education and Clinical Center (GRECC); National Institute of Neurological Disorders and Stroke 1RO1 NS 24282-08; the France-Merrick Foundation; the Johns Hopkins GCRC (NCRR MO1-00052); and the Eleanor Naylor Dana Charitable Trust, Deutsche Forschungsgemeinschaft (Lu 748/2, 748/3).
Raglio 2021[18]	**Music interventions delivered by healthcare professionals** (n=33) Sonofication. Synthesized sounds/musical texture and their parameters (mainly rhythm, pitch/melody, intensity/dynamics, harmony and	**Adults who have had a first or recurrent stroke** Mean age (SD): 63.6 (13.1) years N = 65 Time after stroke (median [IQR]): Intervention: 29.5 (31.8) days Control: 34.5 (38.3) days	Person/participant generic health-related quality of life at <6 months Withdrawal due to adverse events at <6 months	Setting: Rehabilitation units (outpatient follow up) in Italy Funding: This work was partially supported by the "Ricereca Corrente" funding provided by the Italian Ministry of Health.

Study	Intervention and comparison	Population	Outcomes	Comments
	timbre) are used to represent movements characteristics. Delivered by physiotherapists or occupational therapists 5 days a week for 4 weeks, for a total of 20 sessions. Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Other (Sonofication) **No treatment** (n=32) No music intervention. **Concomitant therapy** All people received usual care for people with subacute strokes (such as occupational therapy, speech therapy, psychological support, lower extremity rehabilitation ect.). All people received standard motor exercises (with or without sonofication). The first phase included passive treatment (15 minutes) while the second phase included active movements (20 minutes).	Severity: Not stated/unclear Type of stroke: No additional information		
Tian 2020[22]	**Music interventions delivered by healthcare professionals** (n=16)	**Adults who have had a first or recurrent stroke** Mean age (SD): 65.5 (13.6) years N = 32	Activities of daily living at <6 months Withdrawal due to adverse events at <6 months	Setting: Inpatient in China Funding: Supported by the Project fund of Shanghai Science

Study	Intervention and comparison	Population	Outcomes	Comments
	Rhythmic auditory stimulation 30 minutes every day, 5 days per week for 4 weeks. Group/individual sessions: Individual Hospital/community: Hospital Type of intervention: Rhythmic auditory cueing **No treatment** (n=16) An additional 15 minutes regular physical therapy and 15 minutes of regular occupational therapy per day. **Concomitant therapy** Everyone received 30 minutes individualised physical therapy and 30 minutes individualised occupational therapy per day, 5 days per week for 4 weeks.	Time after stroke (SD): 4.4 (8.3) months Severity: Not stated/unclear Type of stroke: Frontal temporal lobe = 1 Frontal lobe = 1 Corona radiate = 1 Capsule externa = 1 Thalamus = 3 Basal ganglia = 17 Brainstem = 4 Paraventricular = 1 Cerebellum = 1		and technology commission. The project number was 18411962300
van Delden 2009[23] ULTRA-Stroke Subsidiary studies: Van Delden 2013[24]	**Music interventions delivered by healthcare professionals** (n=19) Modified bilateral arm training rhythmic auditory cueing group applied by physiotherapists and/or occupational therapists working at the rehabilitation centre. Treatment was given as 60 minute sessions, 3 days a week for 6 weeks.	**Adults who have had a first or recurrent stroke** Mean age (SD): 59.8 (11.7) years N = 38 Time after stroke (SD): 9.5 (6.2) weeks Severity: Not stated/unclear Type of stroke: No additional information	Stroke-specific Patient-Reported Outcome Measures at <6 months Withdrawal due to adverse events at <6 months	Setting: A rehabilitation centre (outpatient follow up) in the Nethlands Funding: This study was funded by the Dutch Scientific College of Physiotherapy of the Royal Dutch Society for Physical Therapy.

Study	Intervention and comparison	Population	Outcomes	Comments
	Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Rhythmic auditory cueing **No treatment** (n=19) Dose matched control treatment **Concomitant therapy** No additional information			
Whitall 2011[25]	**Music interventions delivered by healthcare professionals** (n=55) Bilateral arm training with rhythmic auditory cueing for 1 hour, 3 times a week for 6 weeks (for a total of 18 sessions) Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Rhythmic auditory cueing **No treatment** (n=56) Dose matched therapeutic exercises **Concomitant therapy** No additional information	**Adults who have had a first or recurrent stroke** Mean age (SD): 58.7 (11.3) years N = 111 Time after stroke (SD): 4.3 (4.7) years Severity: Not stated/unclear Type of stroke: Brainstem = 6 Cerebellar = 2 Cortex = 39 Multiple = 3 Subcortical = 19	Stroke-specific Patient-Reported Outcome Measures at <6 months (at 6 weeks only) Withdrawal due to adverse events at <6 months (at 4 months)	Setting: Outpatient follow up in the United States of America Funding: P60AG12583; PI AG, NIDDR H H133G010111, the Baltimore Veterans Administration Geriatrics Research, Education and Clinical Center (GRECC). Andreas Luft was supported by DFG SFB 550, C 12.
Zhao 2022[27]	**Music interventions delivered by**	**Adults who have had a first or recurrent stroke**	Psychological distress	Setting: Inpatients in China.

Study	Intervention and comparison	Population	Outcomes	Comments
	healthcare professionals (n=32) Musicokinetic therapy for 30 minutes, twice a day for 8 weeks. Group/individual sessions: Individual Hospital/community : Hospital Type of intervention: Receptive interventions in which participants listen to music **No treatment** (n=33) Dose matched exercise without music. **Concomitant therapy** No additional information	Mean age (SD): 81.14 (8.33) years N = 66 Time after stroke: Subacute (7 days - 6 months) Severity: Not stated/unclear Type of stroke: Not stated/unclear	(depression) at <6 months	Funding: Supported partially by the Tianjin Social Science Foundation of China (TJJX21-011) and the Developmental Program of Liberal and Social Sciences of Nankai University (ZB22BZ0109).

1 **1.1.5.4 Music interventions delivered by non-healthcare professionals**

2 **Table 5: Summary of studies included in the evidence review**

Study	Intervention and comparison	Population	Outcomes	Comments
Tarrant 2021[20] Subsidiary studies: Tarrant 2018[21]	**Music interventions delivered by non-healthcare professionals** (n=20) Singing for people with aphasia intervention consisting of 10 weekly sessions delivered in a community facility across three sites in the South-West of England, with each session lasting 90 minutes. Group/individual sessions: Group	**Adults who have had a first or recurrent stroke** Mean age (SD): 66.5 (10.5) years N = 41 Time after stroke (SD): 5.1 (5.5) years Severity – Aphasia severity: Mild = 27 Moderate = 7 Severe = 7 Type of stroke: No additional information	Patient/participant generic health-related quality of life at <6 months and ≥6 months Carer generic health-related quality of life at ≥6 months Stroke-specific Patient-Reported Outcome Measures at <6 months and ≥6 months Wellbeing scores at <6 months and ≥6 months Participation in leisure	Setting: Three community settings: a church hall, a community centre and a dedicated music venue in the United Kingdom Funding: The trial is funded by the Stroke Association (QQ12/TSA 2016/14). Excess treatment costs have been covered by South Devon and Torbay Clinical Commissioning Group, North East and West Devon

Study	Intervention and comparison	Population	Outcomes	Comments
	Hospital/community: Community Type of intervention: Singing and music-based voice interventions **No treatment** (n=21) No additional treatment **Concomitant therapy** All people received a resource pack in aphasia-friendly format, constructed for the purpose of the study, which provided information on living with aphasia and the available local community services.		activities/social groups scores at <6 months and ≥6 months	Clinical Commissioning group and the University of Exeter Medical School. The report is independent research supported by the National Institute for Health Research Applied Research Collaboration South West Peninsula.

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1 ### 1.1.5.5 Summary matrix

2 **Table 6: Summary matrix of the protocol interventions compared to no treatment**

		Neurologic music therapy delivered by trained healthcare professionals	Music therapy delivered by trained music therapists	Music interventions delivered by healthcare professionals	Music interventions delivered by non-healthcare professionals
Person/participant generic health-related quality of life	<6 months	8 outcomes 1 study (n=61) Low-very low quality	1 outcome 1 study (n=38) Very low quality	9 outcomes 2 studies (n=66) Very low quality	1 outcome 1 study (n=36) Very low quality
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	1 outcome 1 study (n=34) Very low quality
Carer generic health-related quality of life	<6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	1 outcome 1 study (n=34) Very low quality
Activities of daily living	<6 months	No outcomes identified	2 outcomes 2 studies (n=68) Very low quality	2 outcomes 4 studies (n=119) Low-very low quality	No outcomes identified
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
Psychological distress – Depression	<6 months	1 outcome 1 study (n=40) Low quality	2 outcomes 6 studies (n=154) Low-very low quality	2 outcomes 4 studies (n=195) Very low quality	No outcomes identified
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
Psychological distress – Anxiety	<6 months	1 outcome 1 study (n=40) Low quality	No outcomes identified	No outcomes identified	No outcomes identified

		Neurologic music therapy delivered by trained healthcare professionals	Music therapy delivered by trained music therapists	Music interventions delivered by healthcare professionals	Music interventions delivered by non-healthcare professionals
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
Psychological distress – Distress	<6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
Psychological distress (other)	<6 months	No outcomes identified	1 outcome 1 study (n=28) Moderate quality	1 outcome 1 study (n=37) Very low quality	No outcomes identified
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified
Stroke-specific Patient-Reported Outcome Measures	<6 months	1 outcome 1 study (n=61) Very low quality	10 outcomes 3 studies (n=73) Moderate-very low quality	11 outcomes 5 studies (n=192) Very low quality	1 outcome 1 study (n=36) Very low quality
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	1 outcome 1 study (n=34) Very low quality
Wellbeing scores	<6 months	No outcomes identified	1 outcome 1 study (n=25) Very low quality	No outcomes identified	1 outcome 1 study (n=36) Very low quality
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	1 outcome 1 study (n=34) Very low quality
Participation in leisure activities/social groups scores	<6 months	No outcomes identified	1 outcome 1 study (n=18) Very low quality	No outcomes identified	1 outcome 1 study (n=36) Very low quality
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	1 outcome 1 study (n=34)

		Neurologic music therapy delivered by trained healthcare professionals	Music therapy delivered by trained music therapists	Music interventions delivered by healthcare professionals	Music interventions delivered by non-healthcare professionals
					Very low quality
Withdrawal due to adverse events	<6 months	No outcomes identified	1 outcome 4 studies (n=84) Very low quality	1 outcome 7 studies (n=355) Very low quality	1 outcome 1 study (n=41) Very low quality
	≥6 months	No outcomes identified	No outcomes identified	No outcomes identified	No outcomes identified

See Appendix D for full evidence tables.

1.1.6 Summary of the effectiveness evidence

1.1.6.1 Neurologic music therapy delivered by trained music therapists compared to no treatment

Table 7: Clinical evidence summary: neurologic music therapy delivered by trained music therapists compared to no treatment

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with neurologic music therapy delivered by trained music therapists	
Person/participant generic health-related quality of life (SF-36 physical functioning, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕◯◯◯ Very low [a,b]	-	The mean person/participant generic health-related quality of life was 16	**MD 1.43 higher** (1.11 lower to 3.97 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕⊕◯◯ Low [a]	-	The mean person/participant generic health-related quality of life was 8.16	**MD 0.47 higher** (0.78 lower to 1.72 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕⊕◯◯ Low [a]	-	The mean person/participant generic health-related quality of life was 4.71	**MD 0.29 higher** (0.21 lower to 0.79 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final	61 (1 RCT) follow up: 5 weeks	⊕⊕◯◯ Low [a]	-	The mean person/participant generic health-related quality of life was 14.52	**MD 4.11 higher** (2.34 higher to 5.88 higher)	MID = 2 (SF-36 established value)

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with neurologic music therapy delivered by trained music therapists	
values) at <6 months						
Person/participant generic health-related quality of life (SF-36 general health, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕◯◯◯ Very low a,b	-	The mean person/participant generic health-related quality of life was 15.97	**MD 1.46 higher** (0.25 lower to 3.17 higher)	MID = 2 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕⊕◯◯ Low a	-	The mean person/participant generic health-related quality of life was 5	**MD 0.83 higher** (0.34 higher to 1.32 higher)	MID = 4 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕◯◯◯ Very low a,b	-	The mean person/participant generic health-related quality of life was 20.48	**MD 3.75 higher** (1.32 higher to 6.18 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 social functioning, 0-100, higher values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕⊕◯◯ Low a	-	The mean person/participant generic health-related quality of life was 6.81	**MD 0.56 higher** (0.54 lower to 1.66 higher)	MID = 3 (SF-36 established value)
Psychological distress - depression (Hamilton	40 (1 RCT) follow-up: 8 weeks	⊕⊕◯◯ Low b,c	-	The mean psychological distress - depression at <6	MD **1.95 lower** (3.07 lower to	MID = 1.1 (0.5 x median

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with neurologic music therapy delivered by trained music therapists	
Depression Scale, 0-56, lower values are better, final value) at <6 months				months was 10.9	0.83 lower)	baseline SD)
Psychological distress - anxiety (Hamilton Anxiety Rating Scale, 0-56, lower values are better, final value) at <6 months	40 (1 RCT) follow-up: 8 weeks	⊕⊕◯◯ Low[b,c]	-	The mean psychological distress - anxiety at <6 months was 9.65	MD **1.05 lower** (2.46 lower to 0.36 higher)	MID = 1.40 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke adjusted Sickness Impact Profile 30, 0-68, lower values are better, final values) at <6 months	61 (1 RCT) follow up: 5 weeks	⊕◯◯◯ Very low [a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures was 16.42	**MD 1.52 lower** (3.84 lower to 0.8 higher)	MID = 2.1 (0.5 x median baseline SD)

a. 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 and bias in measurement of the outcome)

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

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

1.1.6.2 Music therapy delivered by trained music therapists compared to no treatment

Table 8: Clinical evidence summary: music therapy delivered by trained music therapists compared to no treatment

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with music therapy delivered by trained music therapists	
Patient/participant generic health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final value) at <6 months	38 (1 RCT) follow-up: 2 months	⊕◯◯◯ Very low[a,b]	-	The mean patient/participant generic health-related quality of life at <6 months was 7.49	MD **0.27 higher** (0.7 lower to 1.24 higher)	MID = 0.78 (0.5 x median baseline SD)
Activities of daily living (Korean-Modified Barthel Index, 0-100, higher values are better, change score) at <6 months	30 (1 RCT) follow-up: 8 weeks	⊕◯◯◯ Very low[b,c]	-	The mean activities of daily living at <6 months was 7.2	MD **2 higher** (13.25 lower to 17.25 higher)	MID = 1.85 (Barthel index established MID)
Activities of daily living (Functional independence measure, 18-126, higher values are better, final value) at <6 months	38 (1 RCT) follow-up: 2 months	⊕⊕◯◯ Low[a]	-	The mean activities of daily living at <6 months was 106.89	MD **3.58 higher** (5.2 lower to 12.36 higher)	MID = 22 (Functional independence measure established MID)
Psychological distress - Depression (HADS-D, BDI, Faces scale, PANAS - negative affect [different scale ranges], lower values are better, final values) at <6 months	124 (5 RCTs) follow-up: mean 8 weeks	⊕⊕◯◯ Low[d]	-	-	SMD **0.03 SD lower** (0.39 lower to 0.32 higher)	MID = 0.5 SD (SMD)
Psychological distress -	30 (1 RCT)	⊕◯◯◯	-	The mean psychological	MD **3.21 higher**	MID = 6.1 (0.5 x

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with music therapy delivered by trained music therapists	
Depression (Center for Epidemiologic Studies Depression Scale, 0-60, lower values are better, change score) at <6 months	follow-up: 8 weeks	Very low[b,c]		distress - Depression at <6 months was -9.67	(6.56 lower to 12.98 higher)	median baseline SD)
Psychological distress - Anxiety (HADS-A, BAI [different scale ranges], lower values are better, final values) at <6 months	56 (2 RCTs) follow-up: mean 6 weeks	⊕◯◯◯ Very low[b,e]	-	-	SMD **0.18 SD lower** (0.7 lower to 0.35 higher)	MID = 0.5 SD (SMD)
Psychological distress (PANAS - positive affect, 10-50, higher values are better, final value) at <6 months	28 (1 RCT) follow-up: 4 months	⊕⊕⊕◯ Moderate[b]	-	The mean psychological distress at <6 months was 32.64	MD **4.15 higher** (2.01 lower to 10.31 higher)	MID = 4.7 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke specific quality of life, 49-245, higher values are better, final value) at <6 months	20 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,e]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 159.2	MD **24.5 higher** (7.36 higher to 41.64 higher)	MID = 8.9 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS physical strength, 0-100, higher values are better, final	25 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,f,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 49.1	MD **10.7 lower** (23.83 lower to 2.43 higher)	MID = 8.5 (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 no treatment	Risk difference with music therapy delivered by trained music therapists	
value) at <6 months						
Stroke-specific Patient-Reported Outcome Measures (SIS activities, 0-100, higher values are better, final value) at <6 months	25 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,f,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 53.3	MD **6.4 lower** (20.13 lower to 7.33 higher)	MID = 7.9 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS hand use, 0-100, higher values are better, final value) at <6 months	25 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,f,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 31	MD **12 lower** (33.74 lower to 9.74 higher)	MID = 9.9 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS mobility, 0-100, higher values are better, final value) at <6 months	53 (2 RCTs) follow-up: mean 11 weeks	⊕⊕⊕◯ Moderate[b]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 60.9	MD **4.96 lower** (13.36 lower to 3.44 higher)	MID = 8.8 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS communication, 0-100, higher values are better, final value) at <6 months	53 (2 RCTs) follow-up: mean 11 weeks	⊕⊕⊕◯ Moderate[b]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 82.8	MD **1.89 lower** (8.05 lower to 4.27 higher)	MID = 7.6 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS memory, 0-100, higher values are better, final	53 (2 RCTs) follow-up: mean 11 weeks	⊕⊕◯◯ Very low[b,f,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6	MD **0.65 lower** (9.93 lower to 8.64 higher)	MID = 9.1 (0.5 x median baseline SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects: Risk with no treatment	Anticipated absolute effects: Risk difference with music therapy delivered by trained music therapists	Comments
value) at <6 months				months was 77.1		
Stroke-specific Patient-Reported Outcome Measures (SIS emotion, 0-100, higher values are better, final value) at <6 months	53 (2 RCTs) follow-up: mean 11 weeks	⊕⊕◯◯ Low[b,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 67.9	MD **1.01 lower** (7.7 lower to 9.72 higher)	MID = 8.7 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS social/participation, 0-100, higher values are better, final value) at <6 months	53 (2 RCTs) follow-up: mean 11 weeks	⊕⊕◯◯ Low[b,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 57.2	MD **2.38 higher** (12.84 lower to 8.08 higher)	MID = 8.8 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS recovery, 0-100, higher values are better, final value) at <6 months	25 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,f,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 62.7	MD **1.2 lower** (13.66 lower to 11.26 higher)	MID = 7.5 (0.5 x median baseline SD)
Wellbeing scores (WHO five item well-being index, 0-25, higher values are better, final value) at <6 months	25 (1 RCT) follow-up: 6 weeks	⊕◯◯◯ Very low[b,f,g]	-	The mean wellbeing scores at <6 months was 19	MD **2.4 higher** (1.71 lower to 6.51 higher)	MID = 3.1 (0.5 x median baseline SD)
Participation in leisure activities/social groups (Sickness Impact Profile Social	18 (1 RCT) follow-up: 4 months	⊕◯◯◯ Very low[e,h]	-	The mean participation in leisure activities/social groups at <6 months was 42.88	MD **13.28 lower** (19.7 lower to 6.86 lower)	MID = 3.7 (0.5 x median baseline SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects: Risk with no treatment	Risk difference with music therapy delivered by trained music therapists	Comments
Interaction subscale, 0-102, lower values are better, final value) at <6 months						
Withdrawal due to adverse events at <6 months	84 (4 RCTs) follow-up: 7 weeks	⊕⊕◯◯ Low[i,j]	RD 0.00 (-0.09 to 0.09)	0 per 1,000	**0 fewer per 1,000** (90 fewer to 90 more) [k]	Sample size used to determine precision: 75-150 = serious imprecision, <75 = very serious imprecision.

a. 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)

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

c. 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)

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, bias due to missing outcome data and bias in measurement of the outcome)

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 and bias in measurement of the outcome)

f. 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)

g. Downgraded by 1 increment due to comparator indirectness (due to the comparator group in 1 study receiving an exercise intervention that may have been more intense than that received than the intervention group, however it was unclear as to whether this was the case from the information provided in the study)

h. Downgraded by 1 increments due to population indirectness (10-20% of people in a study having had a traumatic brain injury rather than a stroke)

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

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

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

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1.1.6.3 Music interventions delivered by healthcare professionals compared to passive music listening

Table 9: Clinical evidence summary: music intervention delivered by healthcare professionals compared to passive music listening

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with passive music listening	Risk difference with music intervention delivered by healthcare professionals	
Withdrawal due to adverse events at <6 months	48 (1 RCT) follow up: 3 months	⊕◯◯◯ Very low a,b	RR 4.35 (0.52 to 36.11)	40 per 1,000	**134 more per 1,000** (19 fewer to 1,404 more)	MID (precision): RR = 0.8-1.25.
Withdrawal due to adverse events at ≥6 months	48 (1 RCT) follow up: 6 months	⊕◯◯◯ Very low a,b	RR 4.35 (0.52 to 36.11)	40 per 1,000	**134 more per 1,000** (19 fewer to 1,404 more)	MID (precision): RR = 0.8-1.25.

`a. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to missing outcome data)

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

1.1.6.4 Music interventions delivered by healthcare professionals compared to placebo music therapy

Table 10: Clinical evidence summary: music intervention delivered by healthcare professionals compared to placebo music therapy

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with placebo music therapy	Risk difference with music intervention delivered by healthcare professionals	
Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean difference) at <6 months	48 (1 RCT) follow up: 3 months	⊕◯◯◯ Very low a,b	-	-	**MD 0.7 higher** (1.65 lower to 3.05 higher)	MID = 2.1 (0.5 x SD calculated from mean difference standard error)
Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean	48 (1 RCT) follow up: 6 months	⊕◯◯◯ Very low a,b	-	-	**MD 1.02 higher** (1.36 lower to 3.4 higher)	MID = 2.1 (0.5 x SD calculated from mean difference

Outcomes	№ of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with placebo music therapy	Risk difference with music intervention delivered by healthcare professionals	
difference) at ≥6 months						standard error)
Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at <6 months	48 (1 RCT) follow up: 3 months	⨁◯◯◯ Very low a,b	-	-	**MD 0.69 higher** (1.47 lower to 2.85 higher)	MID = 1.9 (0.5 x SD calculated from mean difference standard error)
Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at ≥6 months	48 (1 RCT) follow up: 6 months	⨁◯◯◯ Very low a,b	-	-	**MD 2 higher** (0.28 lower to 4.28 higher)	MID = 2.0 (0.5 x SD calculated from mean difference standard error)
Participation in leisure activities/social group scores (Mayo-Portland Adaptability Inventory 4 participation, 0-30, higher values are better, mean difference) at <6 months	48 (1 RCT) follow up: 3 months	⨁⨁◯◯ Low a	-	-	**MD 1.72 higher** (11.75 lower to 15.19 higher)	MID = 11.9 (0.5 x SD calculated from mean difference standard error)
Withdrawal due to adverse events at <6 months	48 (1 RCT) follow up: 3 months	⨁◯◯◯ Very low b,c	RR 4.35 (0.52 to 36.11)	40 per 1,000	**134 more per 1,000** (19 fewer to 1,404 more)	MID (precision) = RR 0.8-1.25.
Withdrawal due to adverse events at ≥6 months	48 (1 RCT) follow up: 6 months	⨁◯◯◯ Very low b,c	RR 4.35 (0.52 to 36.11)	40 per 1,000	**134 more per 1,000** (19 fewer to 1,404 more)	MID (precision) = RR 0.8-1.25.

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 and bias due to missing outcome data)

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

c. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to missing outcome data)

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1.1.6.5 Music interventions delivered by healthcare professionals compared to no treatment

Table 11: Clinical evidence summary: music intervention delivered by healthcare professionals compared to no treatment

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comment
				Risk with no treatment	Risk difference with music intervention delivered by healthcare professionals	
Person/participant generic health-related quality of life (SF-36 physical function, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 45	MD **10.3 higher** (4.31 lower to 24.91 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 50.4	MD **6.3 higher** (13.48 lower to 26.08 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 23.7	MD **6.1 lower** (29.41 lower to 17.21 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 53.2	MD **6.8 higher** (8.74 lower to 22.34 higher)	MID = 2 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 general	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at	MD **3.9 higher** (9.57 lower to 17.37 higher)	MID = 2 (SF-36 established value)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects: Risk with no treatment	Anticipated absolute effects: Risk difference with music intervention delivered by healthcare professionals	Comments
health, 0-100, higher values are better, final value) at <6 months				<6 months was 57.2		
Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⨁◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 70.9	MD **5.6 higher** (21.41 lower to 32.61 higher)	MID = 4 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⨁◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 66.3	MD **4.8 higher** (9.05 lower to 18.65 higher)	MID = 3 (SF-36 established value)
Person/participant generic health-related quality of life (SF-36 social function, 0-100, higher values are better, final value) at <6 months	37 (1 RCT) follow-up: 4 weeks	⨁◯◯◯ Very low[b,c]	-	The mean person/participant generic health-related quality of life at <6 months was 64.7	MD **11 higher** (7.93 lower to 29.93 higher)	MID = 3 (SF-36 established value)
Person/participant health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final value) at <6 months	29 (1 RCT) follow-up: 2 months	⨁⨁◯◯ Low[d]	-	The mean person/participant health-related quality of life at <6 months was 7.34	MD **0.49 lower** (1.65 lower to 0.67 higher)	MID = 0.78 (0.5 x median baseline SD)
Activities of daily living (Canadian Occupational Performance Measure,	89 (3 RCTs) follow-up: 6 weeks	⨁◯◯◯ Very low[b,e,f]	-	-	SMD **0.64 SD higher** (0.15 lower to 1.42 higher)	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 no treatment	Risk difference with music intervention delivered by healthcare professionals	
University of Maryland Arm Questionnaire for Stroke, Activities of daily living score [different scale ranges], higher values are better, change scores) at <6 months						
Activities of daily living (Barthel index, 0-100, higher values are better, final value) at <6 months	30 (1 RCT) follow-up: 4 weeks	⊕⊕◯◯ Low[g]	-	The mean activities of daily living at <6 months was 69.67	MD **10.66 higher** (4.85 higher to 16.47 higher)	MID = 1.85 (Barthel index established MID)
Psychological distress - Depression (Hamilton's Depression Scale-17, 0-56, lower values are better, change score) at <6 months	60 (1 RCT) follow-up: 17 days	⊕◯◯◯ Very low[b,e]	-	The mean psychological distress - Depression at <6 months was -4.9	MD **1.3 lower** (2.22 lower to 0.38 lower)	MID = 1.9 (0.5 x median baseline SD)
Psychological distress - Depression (BDI, Hamilton Depression Rating Scale-24, profile of mood states [different scale ranges], lower values are better, final values) at <6 months	135 (3 RCTs) follow-up: mean 6 weeks	⊕◯◯◯ Very low[b,h]	-	-	SMD **0.68 SD lower** (1.03 lower to 0.33 higher)	MID = 0.5 SD (SMD)
Psychological distress (PANAS positive affect, 10-50, higher values are better, change score) at <6 months	37 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b]	-	The mean psychological distress at <6 months was 30.3	MD **3.4 higher** (1.95 lower to 8.75 higher)	MID = 4.3 (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 no treatment	Risk difference with music intervention delivered by healthcare professionals	
Stroke-specific Patient-Reported Outcome Measures (SIS [different scale ranges], higher values are better, change scores) at <6 months	89 (2 RCTs) follow-up: 8 weeks	⊕◯◯◯ Very low[b,f,h]	-	-	SMD **1.23 SD lower** (2.57 lower to 0.1 higher)	MID = 0.5 SD (SMD)
Stroke-specific Patient-Reported Outcome Measures (SIS strength subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 11.7	MD **12.8 lower** (21.9 lower to 3.7 lower)	MID = 7.4 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS memory subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was -0.9	MD **1.1 higher** (5.07 lower to 7.27 higher)	MID = 8.1 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS emotion subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 3.9	MD **1.9 higher** (8.54 lower to 12.34 higher)	MID = 7.6 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS communication	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome	MD **0.8 lower** (9.4 lower to 7.8 higher)	MID = 7.0 (0.5 x median baseline SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects: Risk with no treatment	Risk difference with music intervention delivered by healthcare professionals	Comments
subscale, 0-100, higher values are better, change score) at <6 months				Measures at <6 months was 3.1		
Stroke-specific Patient-Reported Outcome Measures (SIS ADL subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 0	MD **2.8 higher** (6.28 lower to 11.88 higher)	MID = 9.1 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS mobility subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 3.1	MD **1.3 lower** (7.6 lower to 5 higher)	MID = 12.8 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS hand function subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 9.7	MD **1.8 higher** (13.96 lower to 17.56 higher)	MID = 13.5 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SIS social participation subscale, 0-100, higher values are better, change score) at <6 months	32 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[b,i]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 3.1	MD **3.7 higher** (10.15 lower to 17.55 higher)	MID = 10.0 (0.5 x median baseline SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects: Risk with no treatment	Anticipated absolute effects: Risk difference with music intervention delivered by healthcare professionals	Comments
Stroke-specific Patient-Reported Outcome Measures (Stroke Specific Quality of Life [different scale ranges], higher values are better, final values) at <6 months	71 (2 RCTs) follow-up: mean 6 weeks	⨁◯◯◯ Very low[b,f,h]	-	-	SMD **0.4 SD higher** (0.28 lower to 1.09 higher)	MID = 0.5 SD (SMD)
Withdrawal due to adverse events at <6 months	355 (7 RCTs) follow-up: mean 7 weeks	⨁◯◯◯ Very low[j,k,l]	RD 0.01 (-0.05 to 0.07)	79 per 1,000	**10 fewer per 1,000** (70 fewer to 50 more) [m]	Precision calculated through Optimal Information Size (OIS) due to zero events in some studies. OIS determined power for the sample size = 0.04 (0.8-0.9 = serious, <0.8 = very serious).

a. 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 and bias in selection of the reported result)

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

c. 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 in selection of the reported result)

d. 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)

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 and bias in measurement of the outcome)

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

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with music intervention delivered by healthcare professionals	

g. 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)

h. 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)

i. 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)

j. 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, bias in measurement of the outcome and bias in selection of the reported result)

k. Downgraded for heterogeneity due to conflicting number of events in different studies (zero events in one or more studies)

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

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

1.1.6.6 Music interventions delivered by non-healthcare professionals compared to no treatment

Table 12: Clinical evidence summary: music interventions delivered by non-healthcare professionals compared to no treatment

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with music intervention delivered by non-healthcare professionals	
Person/participant generic health-related quality of life (EQ-5D 5L, -0.11-1, higher values are better, final value) at <6 months	36 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at <6 months was 0.727	MD **0.04 lower** (0.21 lower to 0.12 higher)	MID = EQ-5D 0.03 (established MID)
Person/participant generic health-related quality of life	34 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c]	-	The mean person/participant generic health-related	MD **0.1 higher** (0.06 lower	MID = EQ-5D 0.03 (established MID)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with no treatment	Risk difference with music intervention delivered by non-healthcare professionals	
(EQ-5D 5L, -0.11-1, higher values are better, final value) at ≥6 months				quality of life at ≥6 months was 0.651	to 0.26 higher)	
Carer generic health-related quality of life (CarerQoL-7D, 0-14, higher values are better, final value) at ≥6 months	34 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c]	-	The mean carer generic health-related quality of life at ≥6 months was 9	MD **0** (1.97 lower to 1.97 higher)	MID = 1.2 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at <6 months	36 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures at <6 months was 3.6	MD **0** (0.49 lower to 0.49 higher)	MID = 0.35 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at ≥6 months	34 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c]	-	The mean stroke-specific Patient-Reported Outcome Measures at ≥6 months was 3.4	MD **0.3 higher** (0.2 lower to 0.8 higher)	MID = 0.35 (0.5 x median baseline SD)
Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at <6 months	36 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[b,d]	-	The mean wellbeing scores at <6 months was 0.748	MD **0.07 higher** (0.3 lower to 0.44 higher)	MID = 0.07 (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 no treatment	Risk difference with music intervention delivered by non-healthcare professionals	
Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at ≥6 months	34 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,d]	-	The mean wellbeing scores at ≥6 months was 0.777	MD **0.04 higher** (0.06 lower to 0.13 higher)	MID = 0.07 (0.5 x median baseline SD)
Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at <6 months	36 (1 RCT) follow-up: 3 months	⊕⊕◯◯ Low[a,b]	-	The mean participation in leisure activities/social groups scores at <6 months was 22.1	MD **1 higher** (3.39 lower to 5.39 higher)	MID = 3.5 (0.5 x median baseline SD)
Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at ≥6 months	34 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c]	-	The mean participation in leisure activities/social groups scores at ≥6 months was 22.1	MD **1.8 higher** (2.86 lower to 6.46 higher)	MID = 3.5 (0.5 x median baseline SD)
Withdrawal due to adverse events at <6 months	41 (1 RCT) follow-up: 3 months	⊕⊕◯◯ Low[b]	Peto OR 8.19 (0.49 to 135.71)	0 per 1,000	**100 more per 1,000** (50 fewer to 250 more) [e]	MID (precision) = Peto OR 0.8-1.25.

a. 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)

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

c. 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)

d. 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 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 no treatment	Risk difference with music intervention delivered by non-healthcare professionals	
e. Absolute effect calculated by risk difference due to zero events in at least one arm of one study						

See Appendix F for full GRADE tables.

1.1.7 Economic evidence

1.1.7.1 Included studies

One health economic study was included in this review.[20] This related to a music intervention delivered by non-healthcare professionals. This is summarised in the health economic evidence profile below (Table 13) and the health economic evidence table in **Error! Reference source not found.**.

No health economic studies were included that related to neurologic music therapy delivered by trained music therapists, music therapy delivered by trained music therapists or music interventions delivered by healthcare professionals.

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 **Error! Reference source not found.**.

1.1.8 Summary of included economic evidence

Table 13: Health economic evidence profile: music interventions delivered by non-healthcare professionals compared to no treatment

Study	Applicability	Limitations	Other comments	Incremental cost	Incremental effects	Cost effectiveness	Uncertainty
Tarrant 2021 [20] (UK)	Partially applicable[(a)]	Potentially serious limitations[(b)]	• Within-RCT analysis (Tarrant 2021[20]) • Cost-utility analysis (CUA) (health outcome: QALYs) • Population: Adults with post-stroke aphasia • Comparators: 1. Control group (no treatment) 2. Singing groups for people with aphasia (SPA) • Time horizon: 6-months follow-up	£399[(c)]	0.05 QALYs From clinical review (2 vs 1) – same paper: **EQ-5D-5L scores**[(d)] 3-month follow-up: -0.04 6-month follow-up: 0.10 **Carer generated health-related quality of life (CarerQoL-7D):**[(d)] 3-month follow-up: NR 6-month follow-up: 0.00 Other outcomes were reported and can be seen in clinical evidence table.	£7,980 per QALY gained.[(e)]	Cost CI: not reported EQ-5D-5L CI: 3-month follow-up: -0.21 to 0.12 6-month follow-up: -0.06 to 0.26 CarerQoL-7D CI: 6-month follow-up: -1.97 to 1.97 No sensitivity analyses undertaken.

Abbreviations: CI = 95% confidence interval; ICER= incremental cost-effectiveness ratio; QALY= quality-adjusted life years; RCT= randomised controlled trial

(a) Mean EQ-5D-5L scores (UK tariff) at 6-months were used to calculate the cost per QALY gained for this review: the NICE reference case currently prefers EQ5D-3L. It is not stated that an NHS and PSS perspective is taken however, the costs included are all considered relevant if the intervention is funded by the NHS.

(b) 6-month time horizon may not capture full health benefits of the intervention if these persist. Pilot feasibility RCT (n=41) that was not powered to test the effectiveness of the intervention or differences in healthcare resource use; the aim was to inform a future study where effectiveness and cost-effectiveness could be assessed. Within-trial analysis only reflects health outcomes and resource use from single trial; however, as this was the only trial included in the clinical review for music interventions delivered by non-healthcare professionals and so reflects the best currently available evidence. It is unclear if all relevant costs are included; interventions costs were included but other healthcare resource use was collected but not included; other healthcare resource used was numerically higher with the interventions but authors note the study was not powered to detect differences and did not present these as costs. Sensitivity analysis was not performed.

(c) 2019 UK pounds. Cost components incorporated: training costs, staff time during training and delivery of the intervention, travel costs for facilitators and singing champions, course materials (song books, percussion instruments, badges, and flip charts), venue costs and refreshments.

(d) Mean difference taken from figures 60, 65 and 66 of guideline clinical review.

(e) Cost per QALY gained not reported but was estimated using 6-month EQ-5D-5L scores collected within the study and assuming no difference in mortality.

1.1.9 Economic model

This area was not prioritised for new cost-effectiveness analysis.

1.1.10 Unit costs

Music therapy and music interventions require additional resource use compared to not providing such interventions related to staff time and equipment. Studies included in the clinical review reported varied resource use (see Table 1 for details) due to:

- Variation in the delivery of therapy sessions: studies based on music therapists delivering therapy reported both individual and group-based sessions, while all but one of the studies[8] that delivered therapy using health care professionals (HCPs) reported sessions on an individual basis. Group therapy will be lower cost per person.
- Significant variation in the frequency and duration of music therapy delivered, with sessions ranging from 20-90 minutes for 1-5 days per week. In the included clinical studies music therapy was generally delivered for between 5 and 10 weeks.
- Additional equipment required as part of the intervention, such as instruments (particularly keyboards, percussion/melodic instruments), metronomes, digital audio interface programs, iPod Nanos, music tapes and mindfulness audio materials.
- Clinical setting, as most studies were conducted in either an inpatient setting or as part of outpatient follow-up rehabilitation care in hospital. Jeong 2007[8] and Tarrant (2018,[21] 2021[20]) were the only two studies that were conducted in a community setting. Baylan 2020[1] provided materials for participants to carry out sessions in their own time.
- Music interventions delivered by non-healthcare professionals may be funded by the NHS.

Relevant unit costs are provided below to aid consideration of cost effectiveness.

Table 14: Unit costs of health care professionals who may be involved in delivering music therapy interventions

Resource	Cost per working hour (hospital/community)[(a)]	Source
Band 6 Music therapist (Arts therapist (entry level)[(b)]	£52/£54	PSSRU 2021{, #4635}
Band 7 Music Therapist (Art therapist)[(b)]	£63/£65	
Band 6 PT/OT	£53/£55	
Band 7 PT/OT	£64/£67	

Abbreviations: OT= occupational therapist; PT= physiotherapist; PSSRU= personal and social services research unit

(a) Costs per working hour include salary, salary oncosts, overheads (management and other non-care staff costs including administration and estates staff) and capital overheads. For PT/OT costs it also includes qualification costs; qualification costs are not included in music therapist costs (qualification costs are not reported by PSSRU for art therapists and music therapy does not qualify for NHS bursaries).

(b) The British Association for Music Therapy (BAMT) states that a music therapist falls under the title of Arts therapist as listed in the PSSRU (2021).

Music therapists can complete additional specialist training to become 'neurologically trained' and thus provide neurologic music therapy (NMT). The committee advised that this training typically consists of a short course and people would typically still be employed at band 6 or 7. Health care professionals that delivered music interventions in the included clinical studies were either a physiotherapist or an occupational therapist. One study[10] also provided counselling by a licensed psychotherapist for both trial arms, while another had therapy materials delivered by an assistant psychologist[1] however, such staff types were not mentioned in any of the other studies.

1.1.11 Evidence statements

Effectiveness/Qualitative

Economic

One cost-utility analysis found that a singing group intervention for people with aphasia was cost-effective compared to usual care (£7,980 per QALY gained). This study was assessed as partially applicable with potentially serious limitations.

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, activities of daily living, psychological distress, stroke-specific Patient-Reported Outcome Measures, wellbeing scores, participation in leisure activities/social group scores and withdrawal due to adverse events. All outcomes were considered equally important for decision making and therefore have all been rated as critical. The committee noted that music therapy may have benefits in other outcomes, such as physical function, communication and cognition. The committee considered that the outcomes included (namely health-related quality of life, activities of daily living and stroke-specific Patient-Reported Outcome Measures) would also encompass any such benefits. The committee considered wellbeing scores and participation in leisure activities/social groups score as important to capture the holistic benefits that could be experienced by people participating in music interventions. The committee chose to investigate these outcomes at less than 6 months and more than and equal to 6 months, as they considered that there could be a difference in the short-term and long-term effects of the intervention.

All outcomes were reported in at least 1 study but were not given in others. The limited evidence produced an element of uncertainty, and the committee agreed that there was insufficient evidence to make a recommendation.

1.1.12.2 The quality of the evidence

Twenty one randomised controlled trials were included in the review. Evidence was available for the following comparisons:

- Neurologic music therapy delivered by trained music therapists compared to no treatment (2 studies)
- Music therapy delivered by trained music therapists compared to no treatment (7 studies)
- Music intervention delivered by healthcare professionals compared to passive music listening (1 study)
- Music intervention delivered by healthcare professionals compared to placebo music therapy (1 study)
- Music intervention delivered by healthcare professionals compared to no treatment (11 studies)
- Music intervention delivered by non-healthcare professionals compared to no treatment (1 study)

There was limited evidence comparing any intervention to comparators other than no treatment (including comparisons to other music interventions, passive music listening and placebo music therapy).

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 and imprecision. Risk of bias was commonly due to selection, performance, attrition and measurement bias. A significant number of studies had different baseline values for outcomes between the intervention and comparator study groups. The majority of studies had very small sample sizes, which contributed to the imprecision in the outcomes. In most cases, it was not possible to conduct a meta-analysis on outcomes as there was limited outcome data reported by the studies that was comparable enough to be meta-analysed. Where meta-analysis was possible, outcomes often had heterogenous results within studies where there was an insufficient number of studies to form valid subgroups. In these cases, outcomes were downgraded for inconsistency. Indirect evidence was uncommon, although 1 study reported a population that may have included people who did not have a stroke and so was downgraded for population indirectness.

The type of music therapy or music intervention varied between studies. This included rhythmic auditory cueing; interventions where music instruments are played (including clinical improvisation); receptive interventions in which participants listen to music; singing and music-based voice interventions; sonofication; and combinations of these interventions. the above. For the most part, these interventions were offered as a part of music therapy or as music interventions delivered by non-music therapists. However, the majority of studies reporting rhythmic auditory cueing were delivered by physiotherapists or occupational therapists rather than music therapists.

The no-treatment comparison varied. This included scenarios where no additional therapy was offered to participants who did not receive music interventions, but also included studies where usual care was offered to both study arms (which could include physiotherapy, occupational therapy, speech therapy and psychological support) and therefore the only difference in care was the music intervention.

The committee concluded that the evidence was of low quality. They acknowledged the effects that the heterogenous baseline values and small sample sizes had on the quality rating and took this into consideration while interpreting the evidence. They noted the potential bias introduced by the baseline values between intervention and control arms made it difficult to interpret the evidence. Consequentially, they found it difficult to interpret the effectiveness of music therapy and music interventions based on the evidence currently available.

1.1.12.3 Benefits and harms

1.1.12.3.1 Neurologic music therapy delivered by trained music therapists

The results showed that, when compared to no treatment, there were clinically important benefits in some subscales for person/participant generic health-related quality of life (namely SF-36 vitality and mental health) and psychological distress – depression at less than 6 months, but otherwise no clinically important difference in other subscales for health-related quality of life, psychological distress - anxiety and in stroke-specific Patient-Reported Outcome Measures at less than 6 months.

These outcomes were reported in 2 small studies with the outcomes being of low to very low quality. With this, the committee acknowledged that the evidence in this area was limited and insufficient to make a recommendation for neurologic music therapy. However, they noted the possible benefits in the intervention and made a research recommendation with the aim to gain more high-quality evidence. This should involve a large number of participants and where there were comparisons to active interventions that provide an equal intensity of therapy to those received from a music intervention, and placebo music therapy.

1.1.12.3.2 Music therapy delivered by trained music therapists

The results showed that, when compared to no treatment, there was a clinically important benefit in participation in leisure activities/social groups (based on 1 very small study with 18 participants). There were inconsistent effects seen in activities of daily living and stroke-specific Patient-Reported Outcome Measures with some outcomes showing clinically important benefits, others showing no clinically important difference and others showing clinically important harms. No clinically important difference was seen in person/participant generic health-related quality of life, psychological distress and withdrawal due to adverse events. No outcomes were reported at more than and equal to 6 months.

The evidence came from several small studies (the largest number of participants included in an outcome was 84) with the majority being of very low quality. With this, the committee acknowledged that the evidence in this area was limited. While there were more studies reporting music therapy than neurologic music therapy, the studies reported a range of different outcome measures in small trials that were probably not powered to show reliable changes in outcomes. Studies included intervention and control arms where the baseline values of outcomes were different at the start of the trial, making interpretation difficult. These trials were conducted comparing music therapy to no treatment (or usual care provided in both study arms), with no trials comparing music therapy to an intervention with equal contact with a professional to help show whether it is the music intervention that provides benefit or the interaction with the healthcare professional. These trials were less than 6 months duration with no long-term evidence being available. Based on this, the committee decided that the evidence was insufficient to make a recommendation for music therapy. However, they noted the possible benefits in the intervention and made a research recommendation with the aim to gain more high-quality research. This should involve a large number of participants and include comparisons to active interventions that provide an equal intensity of therapy to those received from a music intervention, or to placebo music therapy.

1.1.12.3.3 Music interventions delivered by healthcare professionals

Evidence was available comparing music interventions delivered by healthcare professionals to passive music listening, placebo music therapy and no treatment. All the outcomes comparing to passive music listening and placebo music therapy were reported in 1 study. When compared to passive music listening, there was a clinically important increase in withdrawal due to adverse events in those receiving a music intervention delivered by healthcare professionals at less than and more than and equal to 6 months (observed in one small study). This was also seen when compared to placebo music therapy. Otherwise, no clinically important difference was seen between music interventions delivered by healthcare professionals and placebo music therapy in psychological distress at less than and more than and equal to 6 months and participation in leisure activities/social group scores at less than 6 months only.

When compared to no treatment, clinically important benefits were seen in some subscales of person/participant health-related quality of life (namely SF-36 physical function, bodily pain, vitality, general health, role emotional, mental health and social function) while other measures showed no clinically important difference (McGill Quality of life) and other subscales showed clinically important harms (SF-36 role physical). Otherwise clinically important benefits were seen in activities of daily living and psychological distress (depression scores). No clinically important difference was seen in psychological distress (positive affect score), stroke-specific Patient-Reported Outcome Measures and withdrawal due to adverse events. Outcomes were only reported at less than 6 months for this comparison. The outcomes were reported in a range of different studies, with some outcomes including a larger number of participants while others had a very small number. However, the majority of evidence was of very low quality.

With this taken into account, committee acknowledged that the evidence in this area was limited. While there were more studies reporting music interventions delivered by healthcare professionals than other interventions, the studies reported a range of different outcome measures in small trials that were likely not sufficiently powered to show reliable changes in outcomes. Studies included intervention and control arms where the baseline values of outcomes were different at the start of the trial, making interpretation difficult. While there was 1 trial comparing music interventions to placebo music therapy and music listening, this was limited evidence and most comparisons studied the effect compared to no treatment (or usual care provided to both study arms). These trials were mostly performed at less than 6 months with limited long-term evidence being available. The committee noted that clinically important harms were seen in some outcomes (in particular, withdrawal due to adverse events). However, they acknowledged that due to the small sample sizes the effect on dichotomous outcomes may be overemphasised and that trials with a larger number of participants were critical for understanding this further. Based on this, the committee decided that the evidence was insufficient to make a recommendation for music interventions delivered by healthcare professionals. However, they noted the possible benefits in the intervention and made a research recommendation with the aim to gain more high-quality research. This should involve a large number of participants and include comparisons to active interventions that provide an equal intensity of therapy to those received from a music intervention, or to placebo music therapy.

1.1.12.3.4 Music interventions delivered by non-healthcare professionals

The results showed that, when compared to no treatment, there are clinically important benefits in person/participant generic health-related quality of life at more than and equal to 6 months. There were no clinically important differences in stroke-specific Patient-Reported Outcome Measures, wellbeing scores and participation in leisure activities/social group scores at less than and more than and equal to 6 months, and carer generic health-related quality of life at more than and equal to 6 months only. There were clinically important harms in person/participant health-related quality of life at less than 6 months and withdrawal due to adverse events at less than 6 months. These outcomes were reported in 1 small study (with ≤41 participants) with the majority of outcomes being very low quality. Taking this into account, the committee agreed that the evidence was limited.

On examining the effect on person/participant generic health-related quality of life, the committee thought that the small study size considered that it could be possible that people with stroke may feel apprehensive at the start of the trial and may not engage more with the singing group until later on, which may have an effect on their initial quality of life results. However, the committee acknowledged the wide confidence intervals showing very serious imprecision in the outcomes, which affected their confidence in the results. Due to the limitations in the evidence, the committee decided not to recommend music interventions delivered by non-healthcare professionals. However, they noted the possible benefits in the intervention and made a research recommendation with the aim to gain more high-quality research. This should involve a large number of participants and include comparisons to active interventions that provide an equal intensity of therapy to those received from a music intervention, or to placebo music therapy.

1.1.12.4 Cost effectiveness and resource use

No health economic studies were included that related to either music therapy (including neurologic music therapy) delivered by trained music therapists or music interventions delivered by healthcare professionals.

The review identified one health economic analysis that compared a music intervention (singing for people with aphasia (SPA)) delivered by non-healthcare professionals to no treatment. This was a within-trial cost-utility analysis of a pilot feasibility RCT which was included in the clinical review. The intervention lasted 10 weeks and involved 1.5-hour group sessions once a week which were led by a music facilitator and assisted by an individual with post-stroke aphasia. The trial was designed to assess feasibility of a trial to assess effectiveness and cost effectiveness and so had a small sample size (n=41) and was not powered to test the effectiveness of the SPA intervention.

Only intervention costs were considered. It was not stated that an NHS and PSS perspective was taken, however, the costs included are all considered relevant if the intervention is funded by the NHS. A micro-costing approach was adopted to estimate the intervention costs associated with SPA, taken from trial notes on staffing, purchases of equipment and venue costs charged by the sites. The authors then costed the staff at equivalent grades to the NHS PSSRU to show the costs that would be borne to the NHS if it were to provide these. The results found that the average cost of the intervention per participant was £399 including training costs, based on 2019-unit costs. Data on other healthcare resource use was collected but not included in cost calculations; other healthcare resource used was numerically higher with the intervention although the authors note the study was not powered to detect differences (as 1 of the objectives of the pilot study was to assess feasibility of collection).

A negative effect (-0.04) on quality of life (EQ-5D-5L) was found for participants at 3 months compared to the control group, and an improvement was found (0.10) at 6 months. Treatment effects beyond 6 months were not assessed. No change in carer quality of life (CarerQoL 7-D) was reported. Cost per QALY not reported but was estimated for this review to be £7,980 per QALY gained using 6-month EQ-5D-5L scores collected within the study and assuming no difference in mortality. This suggests that the intervention was cost-effective, however, there is uncertainty around these results as the confidence intervals for the quality-of-life follow-up estimates span across positive and negative values. As such, the committee were cautious in interpreting the results.

The study was assessed as partially applicable as mean EQ-5D-5L scores (UK tariff) at 6-months were used to calculate the cost per QALY gained for this review when the NICE reference case currently prefers EQ-5D-3L. Potentially serious limitations were noted for this study due to the small sample size and the fact that it was not powered to test the effectiveness of the music intervention or confirm differences in healthcare resource use between the groups, uncertainty around whether all relevant costs have been included, and uncertainty about long term treatment effects. Sensitivity analyses were also not performed. The committee felt that the study population (adults with post-stroke aphasia) was too specific to reflect the entire stroke population. Previous committee discussions noted that music therapy could potentially be useful to a broad range of people post-stroke but acknowledged that in practice it may be people with a higher level of disability it is used for.

In addition to this study, relevant unit costs were presented to the committee to aid consideration of cost effectiveness of neurologic or standard music therapy delivered by trained music therapists and music interventions delivered by healthcare professionals. Music therapy and interventions require additional resource use related to staff time and equipment. Studies included in the clinical review reported varied resource use, owing to a few factors such as the delivery of therapy sessions (either individual and group-based); the frequency and duration of music therapy delivered (with sessions ranging from 20 to 90 minutes for 1 to 5 days per week for between 5 and 10 weeks); additional equipment (for example, instruments) required as part of the intervention; clinical setting (most reported an inpatient setting or hospital-based outpatient follow-up) and interventions delivered by non-healthcare professionals. The heterogeneity of the interventions reported in the clinical evidence made it challenging for the committee to confidently assess the resource impact of providing these interventions nationwide. Staff costs, however, were found to be similar for healthcare professionals who may be involved in delivering music therapy or interventions. Although neurologic music therapists complete additional specialist training to become ‘neurologically trained’, the committee advised that this training typically consists of a short course and people would typically still be employed at band 6 or 7. Healthcare professionals who delivered music interventions in the included clinical studies were either a physiotherapist or an occupational therapist also be employed at band 6 or 7. One study

(Kim, 2011) also provided counselling by a licensed psychotherapist for both trial arms, while another had therapy materials delivered by an assistant psychologist (Baylan, 2020), however, such staff roles were not mentioned in any other studies. The committee noted that music interventions delivered by the rehabilitation team and non-music therapists are used in current practice, but that music therapy delivered by music therapists and neurologic music therapy are not widely available in the NHS.

The committee discussed the clinical and economic evidence and, based on the limitations described in the clinical evidence section and the uncertainty in the economic evidence, were not able to make recommendations about which music interventions may be appropriate for people following a stroke. A research recommendation has been made.

1.1.12.5 Other factors the committee took into account

The committee acknowledged that benefits may be seen in outcomes specific to impairments that were not included in the protocol (for example: physical function, communication, cognition). A Cochrane review[13] investigating music therapy for people with acquired brain injury had identified additional evidence showing benefit for these outcomes. When designing the protocol, the committee prioritised functional outcomes over impairment-based outcomes which meant that those were not identified. The committee considered that there could be additional benefits during their deliberation.

The committee highlighted that additional therapies may be present that incorporate sound and could therefore be beneficial for people after stroke (for example: sound therapy). While this was not investigated during this guideline update, this was highlighted as a potential area that could be beneficial for people to consider.

Members of the committee also spoke about their own personal experiences of music therapy, stating it significantly improved both their quality of life and that of their family members. They highlighted this as an important area that required consideration in the future. The committee believe that future studies which are larger and more rigorous than those currently available, should be conducted in this area so that a complete understanding of the intervention can be obtained.

It was noted that music therapy interventions may be delivered outside of NHS services by third sector organisations, such as charities (either as outsourcing of services by the NHS or outside of formal care). The involvement of third sector organisations was emphasised by the committee as important for the delivery of interventions in this area.

1.1.13 Recommendations supported by this evidence review

This evidence review supports the research recommendation on music therapy in Appendix K. No recommendations were made for this review.

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Appendices

Appendix A – Review protocols

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

ID	Field	Content
0.	PROSPERO registration number	CRD42021249939
1.	Review title	In people after stroke, what is the clinical and cost effectiveness of music therapy to improve mood and activities of daily living?
2.	Review question	4.8 In people after stroke, what is the clinical and cost effectiveness of music therapy to improve mood and activities of daily living?
3.	Objective	To determine the clinical and cost-effectiveness of music therapy in improving mood and activities of daily living for people after a stroke.
4.	Searches	The following databases (from inception) will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • BAMT Register of Surveys, Research and Evaluation Projects (ROSREP) • CAMbase • Music Therapy World Journal Index Searches will be restricted by: • 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 stroke or recurrent stroke (including people after a subarachnoid haemorrhage) Exclusion: • Children (age <16 years) • People who have had a transient ischaemic attack
7.	Intervention	• Neurologic music therapy delivered by trained music therapists • Music therapy delivered by trained music therapists • Music interventions delivered by healthcare professionals • Music interventions delivered by non-healthcare professionals The interventions will be analysed as separate stratifications.
8.	Comparator	• Compared to each other • Passive music listening (for example: music played in the background) • Placebo music therapy • No treatment Each comparator will be analysed in separate stratifications by different types of comparators.
9.	Types of study to be included	• Systematic reviews of RCTs • Parallel RCTs • Cluster randomised crossover trials (unit of randomisation = unit [for example: hospital, community location]) If there is insufficient randomised trial evidence, non-randomised studies (prospective and retrospective cohort trials) will be considered after discussion with the committee. Published NMAs and IPDs will be considered for inclusion.

10.	Other exclusion criteria	• Non-English language studies • Crossover RCTs (unit of randomisation = participant) Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available.
11.	Context	People 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
		• <6 months
		• ≥6 months
		
		• 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)
		• Activities of daily living (continuous outcomes will be prioritised)
		  ○ Barthel Index
		  ○ National Institutes of Health Stroke Scale
		  ○ Orpington Prognostic Scale
		  ○ Canadian Occupational Performance Measure
		  ○ Extended activities of daily living
		• Psychological distress (continuous outcomes will be prioritised)
		  ○ Depression
		    – PHQ-9
		    – Hospital Anxiety and Depression scale - depression subscale
		    – Beck Depression Inventory
		    – Hamilton Depression Scale

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Centre of Epidemiologic Studies Depression
GHQ-28
Geriatric Depression Scale

Anxiety

GAD-7
Hospital Anxiety and Depression scale - anxiety subscale
The Geriatric Anxiety Inventory
GHQ-28
Beck Anxiety Inventory

Distress

The Distress Management System for Stroke (DMSS)

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)
Neuro-QOL
PROMIS-10
Satisfaction with International Classification of Functioning, Disability and Health – Stroke (SATIS-Stroke)

Wellbeing scores (continuous outcomes will be prioritised)

Warwick-Edinburgh Mental wellbeing scale
WHO-5 World Health Organisation Wellbeing Index
Rosenberg Self Esteem Scale
ICEpop CAPability measure for adults

Participation in leisure activities/social groups scores (continuous outcomes will be prioritised)

Mayo-Portland Adaptability Inventory 4 (MPAI-4) part C (participation)
Frenchay Activities Index

Withdrawal due to adverse events (dichotomous outcome)

If not mentioned above, other validated scores will be considered and discussed with the committee to deliberate on their inclusion.
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<td>14.</td>
<td>Data extraction (selection and coding)</td>
<td>All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated.</td>
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		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
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: Time after stroke at the start of the trial • Hyperacute <72 hours • Acute 72 hours – 7 days • Subacute 7 days – 6 months • Chronic >6 months 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) Group compared to individual sessions of music therapy: • Group sessions • Individual sessions • Mixed (programmes including group and individual) Delivered in hospital compared to delivered in the community: • Hospital sessions • Community sessions • Mixed (programmes including both hospital and community sessions)

		Types of intervention: • Interventions where musical instruments are played (including clinical improvisation) • Singing and music-based voice interventions • Rhythmic auditory cueing • Receptive interventions in which participants listen to music • Songwriting • Any combination of the above		
18.	Type and method of review	☒	Intervention	
		☐	Diagnostic	
		☐	Prognostic	
		☐	Qualitative	
		☐	Epidemiologic	
		☐	Service Delivery	
		☐	Other (please specify)	
19.	Language	English		
20.	Country	England		
21.	Anticipated or actual start date	24/02/2021		
22.	Anticipated completion date	14/12/2022		
23.	Stage of review at time of this submission	Review stage	Started	Completed
		Preliminary searches	☐	☐
		Piloting of the study selection process	☐	☐
		Formal screening of search results against eligibility criteria	☐	☐
		Data extraction	☐	☐
		Risk of bias (quality) assessment	☐	☐
		Data analysis	☐	☐
24.	Named contact	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
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; Music therapy; Rehabilitation; Rhythmic auditory cueing; Stroke	
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	

1 **Review protocol for health economic literature review**

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)[14] 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 15: Database parameters, filters and limits applied

Database	Dates searched	Search filter used
Medline (OVID)	Inception – 08 January 2023	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	Inception – 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 to 2023 Issue 1 of 12 CENTRAL to 2023 Issue 1 of 12	Exclusions (clinical trials, conference abstracts)
CAMbase (Complementary and Alternative Medicine)	Inception – 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.	randomized controlled trial.pt.
29.	controlled clinical trial.pt.
30.	randomi#ed.ti,ab.
31.	placebo.ab.
32.	randomly.ti,ab.
33.	Clinical Trials as topic.sh.
34.	trial.ti.
35.	or/28-34
36.	Meta-Analysis/
37.	exp Meta-Analysis as Topic/
38.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
39.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
40.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
41.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
42.	(search* adj4 literature).ab.
43.	(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.
44.	cochrane.jw.
45.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
46.	or/36-45
47.	music/ or music therapy/ or singing/ or acoustic stimulation/
48.	(music* or rhythm* or melod* or harmon* or sonification).ti,ab.

49.	((auditory or acoustic or sound*) adj5 (stimulat* or cue* or treatment* or rehab* or intervention*)).ti,ab.
50.	(sing or sings or singing or singer or song* or chant* or compose or composing or improvis*).ti,ab.
51.	((vocal or voice) adj5 intonat*).ti,ab.
52.	(play* adj2 instrument*).ti,ab.
53.	((passive or passively) adj2 listen*).ti,ab.
54.	or/47-53
55.	27 and 54
56.	35 or 46
57.	55 and 56

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 or rodent*).ti.
25.	or/17-24
26.	8 not 25
27.	limit 26 to English language
28.	random*.ti,ab.
29.	factorial*.ti,ab.
30.	(crossover* or cross over*).ti,ab.
31.	((doubl* or singl*) adj blind*).ti,ab.

32.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
33.	crossover procedure/
34.	single blind procedure/
35.	randomized controlled trial/
36.	double blind procedure/
37.	or/28-36
38.	systematic review/
39.	meta-analysis/
40.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
41.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
42.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
43.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
44.	(search* adj4 literature).ab.
45.	(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.
46.	cochrane.jw.
47.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
48.	or/38-47
49.	music therapy/ or music/ or singing/ or auditory stimulation/
50.	(music* or rhythm* or melod* or harmon* or sonification).ti,ab.
51.	((auditory or acoustic or sound*) adj5 (stimulat* or cue* or treatment* or rehab* or intervention*)).ti,ab.
52.	(sing or sings or singing or singer or song* or chant* or compose or composing or improvis*).ti,ab.
53.	((vocal or voice) adj5 intonat*).ti,ab.
54.	(play* adj2 instrument*).ti,ab.
55.	((passive or passively) adj2 listen*).ti,ab.
56.	or/49-55
57.	27 and 56
58.	57 and (37 or 48)

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: [Music] explode all trees
#11.	MeSH descriptor: [Music Therapy] explode all trees
#12.	MeSH descriptor: [Singing] explode all trees

#13.	MeSH descriptor: [Acoustic Stimulation] explode all trees
#14.	(music* or rhythm* or melod* or harmon* or sonification):ti,ab
#15.	((auditory or acoustic or sound*) near/5 (stimulat* or cue* or treatment* or rehab* or intervention*)):ti,ab
#16.	(sing or sings or singing or singer or song* or chant* or compose or composing or improvis*):ti,ab
#17.	((vocal or voice) near/5 intonat*):ti,ab
#18.	(play* near/2 instrument*):ti,ab
#19.	((passive or passively) near/2 listen*):ti,ab
#20.	(or #10-#19)
#21.	#9 and #20

CAMbase search terms

1.	Stroke
2.	Music Therapy
3.	1 and 2

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 Quality of Life 1946 – 08 January 2023	Health economics studies Quality of life studies Exclusions (animal studies, letters, comments, editorials, case studies/reports,) English language
Embase (OVID)	Health Economics 1 January 2014 – 08 January 2023 Quality of Life 1974 – 08 January 2023	Health economics studies Quality of life studies Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts) English language

Database	Dates searched	Search filters and limits applied
NHS Economic Evaluation Database (NHS EED) (Centre for Research and Dissemination - CRD)	Inception –31st March 2015	
Health Technology Assessment Database (HTA) (Centre for Research and Dissemination – CRD)	Inception – 31st March 2018	
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

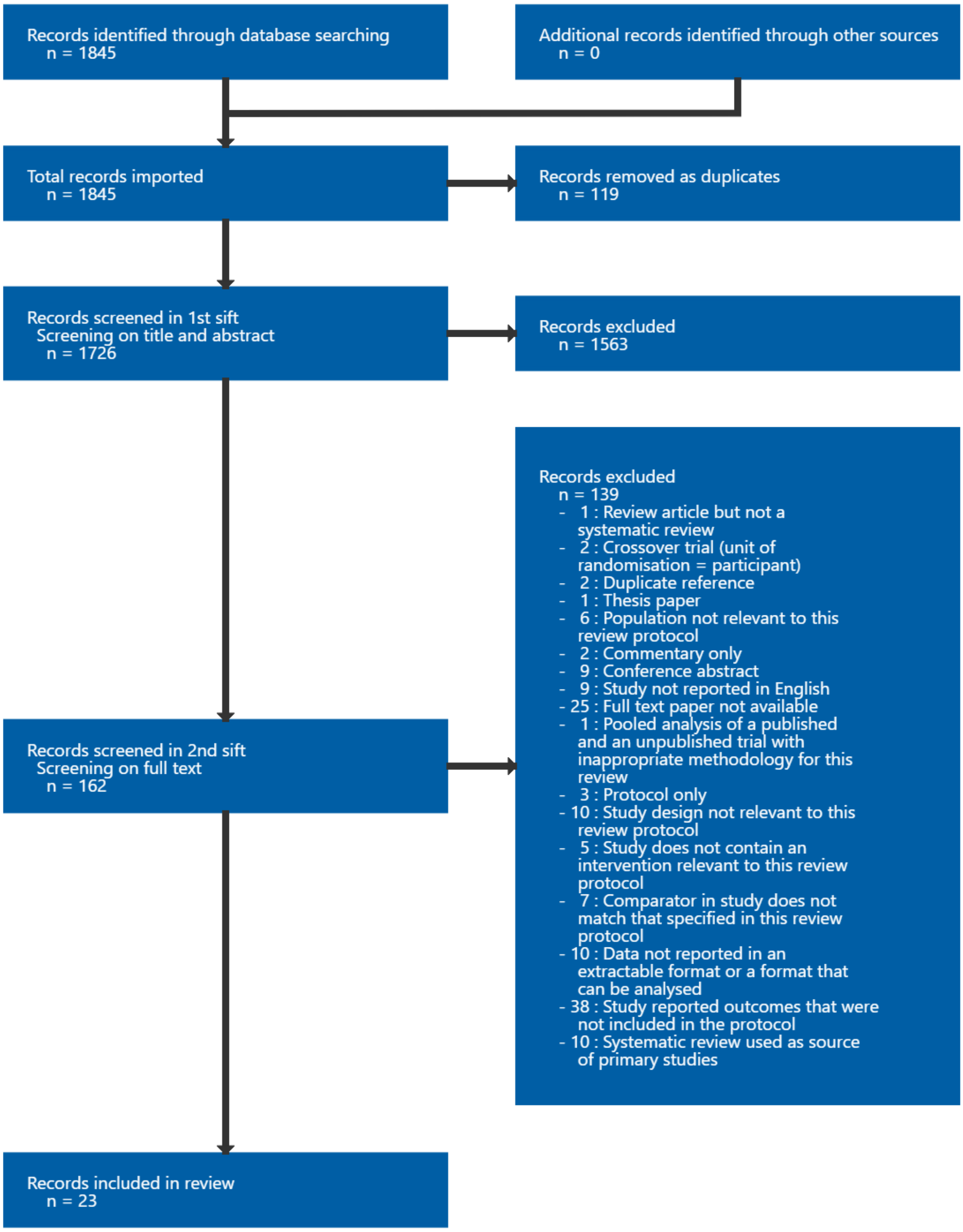
PsycINFO search terms

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 music therapy



Appendix D – Effectiveness evidence

Baylan, 2020

Bibliographic Reference	Baylan, S.; Haig, C.; MacDonald, M.; Stiles, C.; Easto, J.; Thomson, M.; Cullen, B.; Quinn, T. J.; Stott, D.; Mercer, S. W.; Broomfield, N. M.; Murray, H.; Evans, J. J.; Measuring the effects of listening for leisure on outcome after stroke (MELLO): A pilot randomized controlled trial of mindful music listening; International Journal of Stroke; 2020; vol. 15 (no. 2); 149-158

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 - NCT02259062.
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom.
Study setting	Acute Stroke Units within NHS Greater Glasgow and Clyde.
Study dates	12th January 2015 to 28th January 2016.
Sources of funding	This work was supported by the Dunhill Medical Trust, grant R432/0214. Additional support from Scottish Executive Chief Scientist Office (TQ/BC), Stroke Association (TQ) and The Dr Mortimer and Theresa Sackler Foundation (BC/SB).

Inclusion criteria	Native English-speaking adults (aged 18, upper age limit of 80 for the first 11 months of recruitment) in the acute phase (no more than 14 days post-stroke) following clinically and/or radiologically (CT and/or MRI) confirmed diagnosis of ischemic stroke.
Exclusion criteria	Comorbid progressive neurological or neurodegenerative condition; major psychiatric disorder (pre-stroke history of mood disorder or stable antidepressant medication did not lead to exclusion); history of major substance abuse problems; clinically unstable; unable to give informed consent or unable to cooperate with the study protocol (e.g. due to severe aphasia, uncorrected impairment of hearing or vision); co-recruitment with intervention studies with potential impact on mood/cognition.
Recruitment / selection of participants	The Scottish Stroke Research Network nurses approached potential participants at the ward.
Intervention(s)	Music intervention delivered by healthcare professionals N=23 Mindful music listening. People were given an iPod Nano (7th Generation, Apple Inc.) and asked to listen to their material daily on their own for at least an hour during the intervention phase (target 56 hours over 8 consecutive weeks). They were introduced to the concept of mindfulness and were given a recording containing a brief mindfulness exercise (Body scan) to complete daily prior to music listening. The brief exercises focussed on key elements of mindfulness (e.g. paying attention to the present moment). If people were to notice any thoughts or sensations during the exercise and the music listening, they were to allow them to pass and gently bring their attention back to the exercise/music. Delivered by an assistant psychologist.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions

Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Receptive interventions in which participants listen to music With mindfulness exercise
Population subgroups	No additional information.
Comparator	Passive music listening N=24 Listening to music without any mindfulness components. Placebo music intervention N=25 Audiobook listening instead of music listening.
Number of participants	72.
Duration of follow-up	8 weeks of intervention, 3 months and 6 months follow up.
Indirectness	No additional information.
Additional comments	People were analysed on an intention-to-treat basis. Missing data were not imputed.

1

Study arms

Music intervention delivered by healthcare professionals (N = 23)
Mindful music listening. People were given an iPod Nano (7th Generation, Apple Inc.) and asked to listen to their material daily on their own for at least an hour during the intervention phase (target 56 hours over 8 consecutive weeks). They were introduced to the concept of mindfulness and were given a recording containing a brief mindfulness exercise (Body scan) to complete daily prior to music listening. The brief exercises focussed on key elements of mindfulness (e.g. paying attention to the present moment). If people were to notice any thoughts or sensations during the exercise and the music listening, they were to allow them to pass and gently bring their attention back to the exercise/music. Delivered by an assistant psychologist.

Passive music listening (N = 24)
Listening to music without any mindfulness components.

Placebo music intervention (N = 25)
Audiobook listening instead of music listening.

Characteristics

Study-level characteristics

Characteristic	Study (N = 72)
Time after stroke (days) Range	5 to 28
Time after stroke (days) Median (IQR)	19 (NR to NR)

1 ***Arm-level characteristics***

Characteristic	Music intervention delivered by healthcare professionals (N = 23)	Passive music listening (N = 24)	Placebo music intervention (N = 25)
% Female Nominal	10	7	10
Mean age (SD) Mean (SD)	65.3 (11.13)	61.1 (10.36)	65.7 (12.97)
Ethnicity Nominal	NR	NR	NR
Comorbidities Nominal	NR	NR	NR
Severity Nominal	NR	NR	NR
Type of stroke Nominal	NA	NA	NA
Cortical Nominal	15	15	16
Subcortical Nominal	8	9	9

2

Outcomes

Study timepoints

- Baseline
- 6 month
- 3 month

Music intervention delivered by healthcare professional compared to placebo therapy at less than/equal to 6 months

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 23	Music intervention delivered by healthcare professionals, 6 month, N = 23	Music intervention delivered by healthcare professionals, 3 month, N = 23	Passive music listening, Baseline, N = 24	Passive music listening, 6 month, N = 24	Passive music listening, 3 month, N = 24	Placebo music intervention, Baseline, N = 25	Placebo music intervention, 6 month, N = 25	Placebo music intervention, 3 month, N = 25
Psychological distress - Depression (HADS depression) Scale range: 0-42. Adjusted mean difference (between music intervention and placebo). Mean (95% CI)	NR (NR to NR)	1.02 (-1.36 to 3.4)	0.7 (-1.65 to 3.04)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NA (NA to NA)	NA (NA to NA)
Psychological distress - Depression	5 (2 to 7)	NR (NR to NR)	NR (NR to NR)	5 (1.5 to 11.5)	NR (NR to NR)	NR (NR to NR)	6.5 (2 to 8)	NR (NR to NR)	NR (NR to NR)

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 23	Music intervention delivered by healthcare professionals, 6 month, N = 23	Music intervention delivered by healthcare professionals, 3 month, N = 23	Passive music listening, Baseline, N = 24	Passive music listening, 6 month, N = 24	Passive music listening, 3 month, N = 24	Placebo music intervention, Baseline, N = 25	Placebo music intervention, 6 month, N = 25	Placebo music intervention, 3 month, N = 25
(HADS depression) Scale range: 0-42. Adjusted mean difference (between music intervention and placebo). Median (IQR)									
Psychological distress - Anxiety (HADS anxiety) Scale range: 0-42. Adjusted mean difference (between music intervention and placebo). Median (IQR)	7 (6 to 9.5)	NR (NR to NR)	NR (NR to NR)	5 (1.5 to 11.5)	NR (NR to NR)	NR (NR to NR)	7 (3 to 12)	NR (NR to NR)	NR (NR to NR)
Psychological distress - Anxiety (HADS	NR (NR to NR)	2 (-0.28 to 4.28)	0.69 (-1.47 to 2.84)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NA (NA to NA)	NA (NA to NA)

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 23	Music intervention delivered by healthcare professionals, 6 month, N = 23	Music intervention delivered by healthcare professionals, 3 month, N = 23	Passive music listening, Baseline, N = 24	Passive music listening, 6 month, N = 24	Passive music listening, 3 month, N = 24	Placebo music intervention, Baseline, N = 25	Placebo music intervention, 6 month, N = 25	Placebo music intervention, 3 month, N = 25
anxiety) Scale range: 0-42. Adjusted mean difference (between music intervention and placebo). Mean (95% CI)									
Participation in leisure activities/social groups scores (Mayo-Portland Adapatability Inventory 4 participation) Scale range: 0-30. Adjusted mean difference (between music intervention and placebo). Mean (95% CI)	NR (NR to NR)	1.72 (-11.75 to 15.19)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NA (NA to NA)	NR (NR to NR)

1 Psychological distress - Depression (HADS depression) - Polarity - Higher values are better

Psychological distress - Anxiety (HADS anxiety) - Polarity - Higher values are better
Participation in leisure activities/social groups scores (Mayo-Portland Adapatability Inventory 4 participation) - Polarity - Higher values are better
Only reports adjusted mean differences for music intervention compared to placebo, or passive music listening compared to placebo.
The only comparator relevant to our protocol is music intervention compared to placebo.

Music intervention delivered by healthcare professional compared to placebo therapy and passive music listening at less than/equal to 6 months

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 23	Music intervention delivered by healthcare professionals, 6 month, N = 23	Music intervention delivered by healthcare professionals, 3 month, N = 23	Passive music listening, Baseline, N = 24	Passive music listening, 6 month, N = 24	Passive music listening, 3 month, N = 24	Placebo music intervention, Baseline, N = 25	Placebo music intervention, 6 month, N = 25	Placebo music intervention, 3 month, N = 25
Withdrawal due to adverse events Withdrew due to ill health. Mindful music listening: 4, Music group: 1, Audiobook: 1. Nominal	NA	4	4	NA	1	1	NA	1	1

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyatlessthan/equalto6months-Psychologicaldistress-Depression(HADSdepression)-MeanNineFivePercentCI-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t6

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyatlessthan/equalto6months-Psychologicaldistress-Anxiety(HADSanxiety)-MeanNineFivePercentCI-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t6

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyatlessthan/equalto6months-Participationinleisureactivities/socialgroupsscores(Mayo-PortlandAdapatabilityInventory4participation)-MeanNineFivePercentCI-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t6

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyandpassivemusiclisteningatlessthan/equalto6months-Withdrawalduetoadverseevents-Nominal-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t6

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyatlessthan/equalto6months-Psychologicaldistress-Depression(HADSdepression)-MeanNineFivePercentCI-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t3

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyatlessthan/equalto6months-Psychologicaldistress-Anxiety(HADSanxiety)-MeanNineFivePercentCI-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t3

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtoplacebotherapyandpassivemusiclisteningatlessthan/equalto6months-Withdrawalduetoadverseevents-Nominal-Music intervention delivered by healthcare professionals-Passive music listening-Placebo music intervention-t3

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

Cha, 2014

Bibliographic Reference	Cha, Y.; Kim, Y.; Hwang, S.; Chung, Y.; Intensive gait training with rhythmic auditory stimulation in individuals with chronic hemiparetic stroke: a pilot randomized controlled study; Neurorehabilitation; 2014; vol. 35 (no. 4); 681-8

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	Republic of Korea.
Study setting	Outpatient follow up.
Study dates	No additional information.
Sources of funding	This study was supported by S University (2013).
Inclusion criteria	At least six months since a clinical diagnosis of ischaemic or haemorrhagic hemiparetic stroke; sufficient cognitive ability to participate, as indicated by a Mini-Mental State Examination score of 20 or higher; Brunnstrom stage III or IV in the proximal and distal parts of the lower extremity; no serious auditory or visual deficits.
Exclusion criteria	A symptomatic cardiac failure or unstable angina; uncontrolled hypertension; significant orthopaedic or chronic pain conditions affecting gait performance; any neurologic disease except for the initial stroke.
Recruitment / selection of participants	People were recruited from the H hospital. No additional information.
Intervention(s)	Music therapy delivered by a music therapist N=10 Rhythmic auditory stimulation training group. Intensive gait training with rhythmic auditory stimulation. People used a metronome and specifically prepared music tapes (based on personal preference of either pop or country music). A music specialist then played three songs emphasizing the rhythms based on selected music, using a synthesizer keyboard along with the MIDI Cuebase musical instrument digital interface program, and a KM Player version 3.3 to control the rhythmic tempo in each participant. A metronome was played over the beat of the music in order to enhance the rhythmic perception for the person. The metronome was set up so that it matched directly with the person's step pattern. Participants were

	asked to move around a track at a self-selected, comfortable pace for 2 minutes to establish a baseline cadence of rhythmic auditory stimulation. This was then progressively increased over the study duration. Concomitant therapy: All participants received general physical therapy, including Bobath approach and proprioceptive neuromuscular facilitation for 30 minutes per day, five days per week.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information

Comparator	No treatment N=10 Intensive gait training only (same progressive protocol, completed without music). Concomitant therapy: All participants received general physical therapy, including Bobath approach and proprioceptive neuromuscular facilitation for 30 minutes per day, five days per week.
Number of participants	20
Duration of follow-up	6 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	All participants completed the study in their intended arms (available case analysis, no loss of participants).

Study arms

Music therapy delivered by a music therapist (N = 10)

Rhythmic auditory stimulation training group. Intensive gait training with rhythmic auditory stimulation. People used a metronome and specifically prepared music tapes (based on personal preference of either pop or country music). A music specialist then played three songs emphasizing the rhythms based on selected music, using a synthesizer keyboard along with the MIDI Cuebase musical instrument digital interface program, and a KM Player version 3.3 to control the rhythmic tempo in each participant. A metronome was played over the beat of the music in order to enhance the rhythmic perception for the person. The metronome was set up so that it matched directly with the person's step pattern. Participants were asked to move around a track at a self-selected, comfortable pace for 2 minutes to establish a baseline cadence of rhythmic auditory stimulation. This was then progressively increased over the study duration. Concomitant therapy: All participants received general physical therapy, including Bobath approach and proprioceptive neuromuscular facilitation for 30 minutes per day, five days per week.

No treatment (N = 10)
Intensive gait training only (same progressive protocol, completed without music). Concomitant therapy: All participants received general physical therapy, including Bobath approach and proprioceptive neuromuscular facilitation for 30 minutes per day, five days per week.

Characteristics

Arm-level characteristics

Characteristic	Music therapy delivered by a music therapist (N = 10)	No treatment (N = 10)
% Female Sample size	n = 4 ; % = 40	n = 4 ; % = 40
Mean age (SD) (years) Mean (SD)	59.8 (11.7)	63 (14.1)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) Mean (SD)	14.5 (5.5)	14.7 (5.4)
Severity No of events	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Music therapy delivered by a music therapist (N = 10)	No treatment (N = 10)
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Music therapy delivered by music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by a music therapist, Baseline, N = 10	Music therapy delivered by a music therapist, 6 week, N = 10	No treatment, Baseline, N = 10	No treatment, 6 week, N = 10
Stroke-specific Patient-Reported Outcome Measures (Stroke specific quality of life scale) Scale range: 49-245. Final values. Mean (SD)	158.6 (18.3)	183.7 (21.5)	153 (17.1)	159.2 (17.4)

Stroke-specific Patient-Reported Outcome Measures (Stroke specific quality of life scale) - Polarity - Higher values are better

Music therapy delivered by music therapists compared to no treatment at <6 months - dichotomous outcome

Outcome	Music therapy delivered by a music therapist, Baseline, N = 10	Music therapy delivered by a music therapist, 6 week, N = 10	No treatment, Baseline, N = 10	No treatment, 6 week, N = 10
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(Strokespecificqualityoflifescale)-MeanSD-Music therapy delivered by a music therapist-No treatment-t6

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music therapy delivered by a music therapist-No treatment-t6

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

Fujioka, 2018

Bibliographic Reference	Fujioka, T.; Dawson, D. R.; Wright, R.; Honjo, K.; Chen, J. L.; Chen, J. J.; Black, S. E.; Stuss, D. T.; Ross, B.; The effects of music-supported therapy on motor, cognitive, and psychosocial functions in chronic stroke; Annals of the New York Academy of Sciences; 2018; vol. 24; 24

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	NCT01721668.
Study type	Randomised controlled trial (RCT)
Study location	Canada
Study setting	Outpatient follow up
Study dates	No additional information.
Sources of funding	This research was supported by the Canadian Institutes of Health Research and the Heart and Stroke Foundation Ontario.
Inclusion criteria	Unilateral arm and hand impairment; English speaking; near-normal hearing as assessed by clinical audiometry (<40 dB, 250-2000 Hz) and corrected vision adequate for verbal communication; first-time stroke at least 6 months prior to

	enrolment; demonstrating voluntary movement in the arm or hand measured as passing at least one of the Stage 3 tasks on the Chedoke-McMaster Stroke Assessment Impairment Inventory of which we administered only arm and hand sections.
Exclusion criteria	Severe apraxia, aphasia, spatial neglect, or sensory loss in the paretic hand based of the self-report as well as observation during the screening visit; dementia or cognitive impairment based on the Montreal Cognitive Assessment; psychiatric disorders including depression based on the Center for Epidemiological Studies Depression Scale using a cut off score of 20; severe pain and/or fatigue (no more than 45 in any area of the Visual Analogue Scale for Pain with a straight horizontal line of 100-mm length regarding the affected arm, hand and shoulder); extensive prior musical experience (formal musical training >2 years within the past 10 years or >10 years in total).
Recruitment / selection of participants	No additional information.
Intervention(s)	Music therapy delivered by music therapists N=14 Music-supported therapy added to support motor, cognitive and psychosocial functions combined with an existing conventional physical training programme (GRASP). Adjustments included drum pads being assigned pitches on a scale from C to C'; drum sticks, brushes and mallets being used besides palm and fist; African djembe used for timbre and dynamic variations as well as joint music-making with the therapist. These were incorporated into activities. Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to	Individual sessions

individual sessions of music therapy	
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Interventions where musical instruments are played (including clinical improvisation)
Population subgroups	No additional information.
Comparator	No treatment N=15 Conventional physical training programme (GRASP) without music. Including a variety of objects including tea pot and cups, table napkins and rings, scarves and fishing reels etc. Concomitant therapy: No additional information.
Number of participants	28
Duration of follow-up	5-10 weeks (end of intervention, 1 participant chose to complete 15 sessions over 5 weeks, while the remainder chose 30 sessions over 10 weeks) and 4 months.
Indirectness	No additional information.
Additional comments	Intention to treat analysis (last follow up data carried forward).

Study arms

Music therapy delivered by music therapists (N = 14)

Music-supported therapy added to support motor, cognitive and psychosocial functions combined with an existing conventional physical training programme (GRASP). Adjustments included drum pads being assigned pitches on a scale from C to C'; drum sticks, brushes and mallets being used besides palm and fist; African djembe used for timbre and dynamic variations as well as joint music-making with the therapist. These were incorporated into activities. Concomitant therapy: No additional information.

No treatment (N = 15)

Conventional physical training programme (GRASP) without music. Including a variety of objects including tea pot and cups, table napkins and rings, scarves and fishing reels etc. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Music therapy delivered by music therapists (N = 14)	No treatment (N = 15)
% Female Sample size	n = 5	n = 3
Mean age (SD) (years) Mean (SD)	64.2 (9.4)	54.3 (11.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Music therapy delivered by music therapists (N = 14)	No treatment (N = 15)
Time after stroke (years) Mean (SD)	6.1 (6.6)	4.7 (6.7)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 month (3 weeks after completing the training. <6 months.)

Music therapy delivered by a music therapy compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by music therapists, Baseline, N = 14	Music therapy delivered by music therapists, 4 month, N = 14	No treatment, Baseline, N = 15	No treatment, 4 month, N = 14
Psychological distress (Positive affect) Scale range: 10-50. Final values (from PANAS). Mean (SD)	34.43 (7.38)	36.79 (8.19)	29.79 (11.56)	32.64 (8.45)

Outcome	Music therapy delivered by music therapists, Baseline, N = 14	Music therapy delivered by music therapists, 4 month, N = 14	No treatment, Baseline, N = 15	No treatment, 4 month, N = 14
Psychological distress (Negative affect) Scale range: 10-50. Final values (from PANAS). Mean (SD)	20 (6.13)	18 (6.82)	18.5 (8.44)	17.29 (8.56)
Stroke Specific Patient-Reported Outcome Measures (Stroke Impact Scale) Scale range: 0-100. Final values. Mean (SD)	NR (NR)	NR (NR)	NR (NR)	NR (NR)
SIS Mobility Mean (SD)	59.89 (17.08)	60.86 (9.68)	58.11 (15.34)	63.13 (16.61)
SIS Memory Mean (SD)	81.14 (12.78)	82.91 (12.59)	81.88 (26.07)	83.16 (22.55)
SIS Emotion Mean (SD)	71.46 (20.22)	76.8 (18.22)	73.61 (22.86)	77 (20.68)
SIS Communication Mean (SD)	84.23 (14.46)	90.3 (9.23)	82.64 (26.56)	92.11 (10.37)
SIS Social Mean (SD)	59.64 (18.27)	63.52 (14.36)	65.45 (22.09)	59.3 (24.95)

Psychological distress (Positive affect) - Polarity - Higher values are better
Psychological distress (Negative affect) - Polarity - Lower values are better
Stroke Specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Polarity - Higher values are better

Music therapy delivered by a music therapy compared to no treatment at <6 months - dichotomous outcome

Outcome	Music therapy delivered by music therapists, Baseline, N = 14	Music therapy delivered by music therapists, 4 month, N = 14	No treatment, Baseline, N = 15	No treatment, 4 month, N = 14
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress(Positiveaffect)-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress(Negativeaffect)-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-StrokeSpecificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-SISMobility-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-StrokeSpecificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-SISMemory-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-StrokeSpecificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-SISEmotion-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-StrokeSpecificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-SISCommunication-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-continuousoutcomes-StrokeSpecificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-SISSocial-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbyamusictherapycomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music therapy delivered by music therapists-No treatment-t4

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

Grau-Sanchez, 2018

Bibliographic Reference	Grau-Sanchez, J.; Duarte, E.; Ramos-Escobar, N.; Sierpowska, J.; Rueda, N.; Redon, S.; Veciana de Las Heras, M.; Pedro, J.; Sarkamo, T.; Rodriguez-Fornells, A.; Music-supported therapy in the rehabilitation of subacute stroke patients: a randomized controlled trial; Annals of the New York Academy of Sciences; 2018; vol. 01; 01

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	NCT02208219
Study type	Randomised controlled trial (RCT)

Study location	Spain.
Study setting	Outpatient follow up. Rehabilitation delivered in hospital setting.
Study dates	December 2013 to May 2017.
Sources of funding	This work was supported by the Spanish Government (Ministerio de Econom´ıa y Competitivdad, PSI2015-69178-P, Fondo Europeo de Desarrollo Regional (FEDER)).
Inclusion criteria	Mild-to-moderate paresis of the upper extremity after a first-ever stroke; less than 6 months after the stroke; age between 30 and 75 years; able to speak Spanish and/or Catalan.
Exclusion criteria	Major cognitive deficits affecting comprehension (Mini-Mental State Examination >24); neurological or psychiatric comorbidity; previous formal musical education.
Recruitment / selection of participants	People involved in a program of outpatient rehabilitation at the Department of Physical Medicine and Rehabilitation at Hospitals de Mar i de L'Esperanc¸a.
Intervention(s)	Music intervention delivered by a healthcare professional N=20 Music supported therapy delivered by an occupational therapists and physiotherapist. 20 individual sessions (5 sessions per week, 30 minutes each) of music supported therapy involving playing a keyboard and an electronic drum set following a modular therapy regime with stepwise increase of complexity. Concomitant therapy: Both groups received an outpatient rehabilitation program that consisted of two 1 hour group sessions of occupational therapy and physiotherapy a day (5 days per week, 10 hours in total per week).
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14) Mean 5.4 ranging from 2-14.

Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Interventions where musical instruments are played (including clinical improvisation)
Population subgroups	No additional information.
Comparator	No treatment N=20 Additional individual training of the upper extremity. 20 individual sessions (5 sessions per week, 30 minutes each) consisting of passive mobilization, stretch and progressive resistance exercises, and task-specific training. Concomitant therapy: Both groups received an outpatient rehabilitation program that consisted of two 1 hour group sessions of occupational therapy and physiotherapy a day (5 days per week, 10 hours in total per week).
Number of participants	40
Duration of follow-up	Intervention for 4 weeks, 3 months follow up in total.
Indirectness	No additional information.
Additional comments	Available case analysis (any people remaining at the end of the trial, cases where people did not fill out questionnaires excluded).

Study arms

Music intervention delivered by a healthcare professional (N = 20)
Music supported therapy delivered by an occupational therapists and physiotherapist. 20 individual sessions (5 sessions per week, 30 minutes each) of music supported therapy involving playing a keyboard and an electronic drum set following a modular therapy regime with stepwise increase of complexity. Concomitant therapy: Both groups received an outpatient rehabilitation program that consisted of two 1 hour group sessions of occupational therapy and physiotherapy a day (5 days per week, 10 hours in total per week).

No treatment (N = 20)
Additional individual training of the upper extremity. 20 individual sessions (5 sessions per week, 30 minutes each) consisting of passive mobilization, stretch and progressive resistance exercises, and task-specific training. Concomitant therapy: Both groups received an outpatient rehabilitation program that consisted of two 1 hour group sessions of occupational therapy and physiotherapy a day (5 days per week, 10 hours in total per week).

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by a healthcare professional (N = 20)	No treatment (N = 20)
% Female Sample size	n = 8 ; % = 42.1	n = 8 ; % = 40
Mean age (SD) Range	45 to 74	49 to 72
Mean age (SD) Mean (SD)	60.1 (NR)	62.5 (NR)

Characteristic	Music intervention delivered by a healthcare professional (N = 20)	No treatment (N = 20)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (days) Range	32 to 162	28 to 136
Time after stroke (days) Mean (SD)	65.8 (NR)	64.9 (NR)
Severity Range	2 to 14	2 to 9
Severity Mean (SD)	5.8 (NR)	5.3 (NR)
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Ischaemic Sample size	n = 18 ; % = 94.7	n = 14 ; % = 70
Haemorrhagic Sample size	n = 1 ; % = 5.3	n = 6 ; % = 30

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention (no values reported at 3 months for these outcomes). <6 months.)

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcomes (Stroke-specific Patient Reported Outcome Measures)

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 20	Music intervention delivered by a healthcare professional, 4 week, N = 20	No treatment, Baseline, N = 18	No treatment, 4 week, N = 18
Stroke specific Patient-Reported Outcome Measures (Stroke Specific Quality of Life) Scale range: 49-245. Final values. Mean (SD)	174.6 (32.9)	185.9 (38.8)	179.6 (27.7)	183.5 (23.4)

Stroke specific Patient-Reported Outcome Measures (Stroke Specific Quality of Life) - Polarity - Higher values are better

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcomes

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 20	Music intervention delivered by a healthcare professional, 4 week, N = 20	No treatment, Baseline, N = 17	No treatment, 4 week, N = 17
Patient/participant generic health-related quality of life (SF-36) Scale range: 0-100. Final values. Mean (SD)	NR (NR)	NR (NR)	NR (NR)	NR (NR)

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 20	Music intervention delivered by a healthcare professional, 4 week, N = 20	No treatment, Baseline, N = 17	No treatment, 4 week, N = 17
Physical function Mean (SD)	46.2 (23.6)	55.3 (23.4)	39.2 (20.1)	45 (21.9)
Role physical Mean (SD)	14.7 (28)	17.6 (32.8)	17.1 (27.7)	23.7 (38.6)
Pain Mean (SD)	61.1 (34.3)	56.7 (27.5)	54 (36.5)	50.4 (33)
General health Mean (SD)	55.3 (18.3)	61.1 (18.4)	59.1 (21.4)	57.2 (22.7)
Vitality Mean (SD)	55.9 (21.2)	60 (20.3)	48.4 (21.9)	53.2 (26.8)
Social function Mean (SD)	53.8 (26.1)	75.7 (27.5)	54.7 (31.2)	64.7 (30.7)
Role emotional Mean (SD)	62.7 (48.4)	76.5 (40.4)	70.5 (43.1)	70.9 (42.9)
Mental health Mean (SD)	69.6 (17.8)	71.1 (21.2)	61.7 (17.6)	66.3 (21.6)

Outcome	**Music intervention delivered by a healthcare professional, Baseline, N = 20**	**Music intervention delivered by a healthcare professional, 4 week, N = 20**	**No treatment, Baseline, N = 17**	**No treatment, 4 week, N = 17**
Psychological distress - Depression (Beck Depression Inventory) Scale range: 0-63. Final values. Mean (SD)	10.2 (6.9)	8.8 (7.5)	12.3 (8.5)	10.6 (9.1)
Psychological distress (PANAS) Scale range: 10-50. Higher values are better for the positive affect, lower values are better for the negative affect. Final values. Mean (SD)	*empty data*	NR (*empty data*)	*empty data*	NR (NR)
Positive affect Mean (SD)	33.5 (9.5)	33.7 (9.3)	31.5 (7.6)	30.3 (7.3)
Negative affect Mean (SD)	19.8 (9.2)	15.8 (4.9)	21.2 (9)	20 (8.7)

Patient/participant generic health-related quality of life (SF-36) - Polarity - Higher values are better
Psychological distress - Depression (Beck Depression Inventory) - Polarity - Lower values are better

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - dichotomous outcome

Outcome	**Music intervention delivered by a healthcare professional, Baseline, N = 20**	**Music intervention delivered by a healthcare professional, 4 week, N = 19**	**No treatment, Baseline, N = 20**	**No treatment, 4 week, N = 20**
Withdrawal due to adverse events One person withdrew from the music intervention but not for adverse events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 20	Music intervention delivered by a healthcare professional, 4 week, N = 19	No treatment, Baseline, N = 20	No treatment, 4 week, N = 20
(because they transferred to a different clinic) No of events				

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-StrokespecificPatient-ReportedOutcomeMeasures(StrokeSpecificQualityofLife)-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes(Stroke-specificPatientReportedOutcomeMeasures)-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Physicalfunction-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes(Stroke-specificPatientReportedOutcomeMeasures)-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Rolephysical-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes(Stroke-specificPatientReportedOutcomeMeasures)-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Pain-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Generalhealth-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Vitality-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Socialfunction-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Roleemotional-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(SF-36)-Mentalhealth-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(BeckDepressionInventory)-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress(PANAS)-Positiveaffect-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress(PANAS)-Negativeaffect-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t4

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by a healthcare professional-No treatment-t4

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

Hill, 2011

Bibliographic Reference	Hill, V.; Dunn, L.; Dunning, K.; Page, S. J.; A pilot study of rhythm and timing training as a supplement to occupational therapy in stroke rehabilitation; Topics in stroke rehabilitation; 2011; vol. 18 (no. 6); 728-737

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 States of America.
Study setting	Outpatient follow up. Delivered in hospital setting.
Study dates	No additional information.
Sources of funding	Interactive Metronome equipment and software provided for the study.
Inclusion criteria	Right hemiparesis; active flexion of the affected wrist a minimum of 10 degrees and active flexion of the metacarpophalangeal joints of the thumb and at least 2 additional metacarpophalangeal joints in 2 additional fingers at least 10 degrees; stroke experience 1 year or more prior to study enrolment; a score of >23 on the Mini-Mental Status Examination; between the age 21 and 85 years; have experienced one stroke resulting in residual hemiparesis; discharged from all forms of physical rehabilitation; able to follow directions in order to participate in therapy.

Exclusion criteria	Excessive pain in the affected hand, arm, or shoulder, as measured by a score >4 on a 10-point visual analogue scale; excessive spasticity in the affected biceps, triceps, wrist or fingers, as defined by a score >2 at any upper extremity joint on the Modified Ashworth Spasticity Scale; unilateral neglect as measured by observing the subject's interaction with their environment (ie, the subject's lack of attention to one side of their body and environment); absent bilateral or unilateral hearing as indicated by subject report; currently participating in any other experimental rehabilitation or drug studies; passive range of motion <45 degrees for abduction, flexion, or external rotation at shoulder or pronation of forearm of >30 degrees flexion contracture at any finger joint.
Recruitment / selection of participants	People were recruited by local rehabilitation therapists and by subject inquiry regarding current studies.
Intervention(s)	Music intervention delivered by a healthcare professional N=6 Interactive metronome intervention delivered by an occupational therapist. Completing the same exercises as the occupational therapy only group, with an additional 30 minute interactive metronome session. This consisted of a computer-based rhythmic and auditory training program where people had to match the beat from the metronome via a repetitive limb movement lasting for 1-3 minutes. The number of sessions ranged from 10 to 30 dependent on tolerance. Audiovisual guidance was used to provide immediate feedback and help the person get closer to the beat. Movements included clapping hands together, tapping unaffected hand or leg, tapping affected hand on leg, tapping foot on floor mat, and tapping hand on leg and then contralateral foot on floor. All completed both sitting and standing as people progressed through the protocol. 1 hour treatment, 3 times a week for 10 weeks. Concomitant therapy: Usual occupational therapy including prefunctional activities, functional activities and COPM (Canadian Occupational Performance Measure) tasks.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information.
Comparator	No treatment N=4 Usual occupational therapy only. 1 hour treatment, 3 times a week for 10 weeks. Concomitant therapy: Usual occupational therapy including prefunctional activities, functional activities and COPM (Canadian Occupational Performance Measure) tasks.
Number of participants	10
Duration of follow-up	10 weeks (end of intervention)
Indirectness	No additional information.
Additional comments	Intention to treat (no people discontinued the study).

Study arms

Music intervention delivered by a healthcare professional (N = 6)

Interactive metronome intervention delivered by an occupational therapist. Completing the same exercises as the occupational therapy only group, with an additional 30 minute interactive metronome session. This consisted of a computer-based rhythmic and auditory training program where people had to match the beat from the metronome via a repetitive limb movement lasting for 1-3 minutes. The number of sessions ranged from 10 to 30 dependent on tolerance. Audiovisual guidance was used to provide immediate feedback and help the person get closer to the beat. Movements included clapping hands together, tapping unaffected hand or leg, tapping affected hand on leg, tapping foot on floor mat, and tapping hand on leg and then contralateral foot on floor. All completed both sitting and standing as people progressed through the protocol. 1 hour treatment, 3 times a week for 10 weeks. Concomitant therapy: Usual occupational therapy including prefunctional activities, functional activities and COPM (Canadian Occupational Performance Measure) tasks.

No treatment (N = 4)

Usual occupational therapy only. 1 hour treatment, 3 times a week for 10 weeks. Concomitant therapy: Usual occupational therapy including prefunctional activities, functional activities and COPM (Canadian Occupational Performance Measure) tasks.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by a healthcare professional (N = 6)	No treatment (N = 4)
% Female Sample size	n = 4 ; % = 67	n = 2 ; % = 50
Mean age (SD)	62.67 (8.21)	56 (9.02)

Characteristic	Music intervention delivered by a healthcare professional (N = 6)	No treatment (N = 4)
Mean (SD)		
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA
Caucasian Sample size	n = 4 ; % = 67	n = 3 ; % = 75
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years) Mean (SD)	3.67 (2.58)	2.75 (1.71)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 10 week (End of intervention. <6 months.)

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcomes

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 6	Music intervention delivered by a healthcare professional, 10 week, N = 6	No treatment, Baseline, N = 4	No treatment, 10 week, N = 4
Activities of daily living (Canadian Occupational Performance Measure - Performance) Scale range: Unclear (5-50?). Change score. Mean (SD)	14 (7.81)	15 (5.57)	15.6 (7.37)	10.2 (16.18)
Stroke-specific Patient Reported Outcome Measure (Stroke Impact Scale) Scale range: 0-100. Change score. Mean (SD)	76.5 (13.48)	1.25 (6.9)	70.8 (32.33)	7.4 (20)

Activities of daily living (Canadian Occupational Performance Measure - Performance) - Polarity - Higher values are better
Stroke-specific Patient Reported Outcome Measure (Stroke Impact Scale) - Polarity - Higher values are better

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - dichotomous outcome

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 6	Music intervention delivered by a healthcare professional, 10 week, N = 6	No treatment, Baseline, N = 4	No treatment, 10 week, N = 4
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Activitiesofdailyliving(CanadianOccupationalPerformanceMeasure-Performance)-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t10

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Stroke-specificPatientReportedOutcomeMeasure(StrokeImpactScale)-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t10

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by a healthcare professional-No treatment-t10

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

Jeong, 2007

Bibliographic Reference	Jeong, S.; Kim, M. T.; Effects of a theory-driven music and movement program for stroke survivors in a community setting; Applied Nursing Research; 2007; vol. 20 (no. 3); 125-31

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	Seoul, South Korea.
Study setting	A neighbourhood community health center located in the metropolitan area.
Study dates	No additional information.
Sources of funding	This study was supported by the BK21 project (Grant No. 0522-20010002), the Korea Science and Engineering Foundation (Grant No. R04-2001-000-00197-0), and the Research Institute of Nursing Science at Seoul National University.

Inclusion criteria	Have had a stroke at least 6 months earlier; scores of 2-4 on a muscle strength test (indicating poor to moderate muscle strength); disability on one side of the body; intact auditory function; ability to communicate with the research team without problems.
Exclusion criteria	Previous participation in a rehabilitation program.
Recruitment / selection of participants	Recruitment was conducted by trained research assistants, with referrals from the public health nurses working in the centre.
Intervention(s)	Music intervention delivered by healthcare professionals N=16 Rhythmic auditory stimulation music-movement program consisted of four sections: preparatory activities, main activities, wrap-up activities and follow up. This group activity was conducted for 2 hours/week for 8 weeks at a public health center in Seoul, South Korea. Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Group sessions
Subgroup 4: Delivered in hospital compared	Community sessions

to delivered in the community	
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information.
Comparator	No treatment N=17 Received referral information about available usual care services (available to both groups). Concomitant therapy: No additional information.
Number of participants	36 (data is only available for 33).
Duration of follow-up	8 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	Not intention to treat. Missing cases. No additional information.

Study arms

Music intervention delivered by healthcare professionals (N = 16)

Rhythmic auditory stimulation music-movement program consisted of four sections: preparatory activities, main activities, wrap-up activities and follow up. This group activity was conducted for 2 hours/week for 8 weeks at a public health center in Seoul, South Korea. Concomitant therapy: No additional information.

No treatment (N = 17)
Received referral information about available usual care services (available to both groups). Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (N = 16)	No treatment (N = 17)
% Female Sample size	n = 5 ; % = 31.3	n = 5 ; % = 29.4
Mean age (SD) Mean (SD)	58 (7.19)	62.2 (8.16)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years) Mean (SD)	5.44 (4.53)	7.29 (5.3)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Music intervention delivered by healthcare professionals (N = 16)	No treatment (N = 17)
Sample size		
Infarction Sample size	n = 9 ; % = 56.3	n = 11 ; % = 64.7
Haemorrhage Sample size	n = 7 ; % = 43.8	n = 6 ; % = 35.3

1

2 **Outcomes**

3 ***Study timepoints***

4 - Baseline
5 - 8 week (End of intervention. <6 months.)

6

7 ***Music intervention delivered by healthcare professionals compared to no treatment at <6 months***

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 16	Music intervention delivered by healthcare professionals, 8 week, N = 16	No treatment, Baseline, N = 17	No treatment, 8 week, N = 17
Psychological distress (Profile of Mood states) Scale range: 0-136. Final values (but looks too small, ?transformed data). Mean (SD)	2.11 (1.02)	1.56 (0.82)	2.81 (0.9)	2.29 (0.77)
Stroke-specific Patient Reported Outcome Measures (Stroke	3.25 (1.08)	3.58 (0.87)	2.54 (0.8)	2.92 (0.8)

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 16	Music intervention delivered by healthcare professionals, 8 week, N = 16	No treatment, Baseline, N = 17	No treatment, 8 week, N = 17
Specific Quality of Life) Scale range: 49-245. Final values (but looks too small, ?transformed data). Mean (SD)				

Psychological distress (Profile of Mood states) - Polarity - Lower values are better

Stroke-specific Patient Reported Outcome Measures (Stroke Specific Quality of Life) - Polarity - Higher values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-Psychologicaldistress(ProfileofMoodstates)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t8

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-Stroke-specificPatientReportedOutcomeMeasures(StrokeSpecificQualityofLife)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t8

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

Jun, 2013

Bibliographic Reference	Jun, E. M.; Roh, Y. H.; Kim, M. J.; The effect of music-movement therapy on physical and psychological states of stroke patients; Journal of Clinical Nursing; 2013; vol. 22 (no. 12); 22-31

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	Quasi- randomised controlled trial States it is quasi-experimental, but also states it is randomised. Will be included but downgraded for selection bias.
Study location	South Korea.
Study setting	Hospital inpatients.
Study dates	No additional information.
Sources of funding	This work was supported by Dong-eui University Foundation Grant (2011).
Inclusion criteria	An acute ischaemic stroke in the left or right temporal, frontal, parietal or subcortical brain regions; hospitalised less than 2 weeks; were fully conscious without L tube or T tube; could communicate verbally; had a Korean Mini-Mental State Examination Score >20 points; were able and willing to participate in the study
Exclusion criteria	Prior neurological or psychiatric disease; hearing deficit
Recruitment / selection of participants	The total number of people from the neurology unit were invited to participate.
Intervention(s)	Music therapy delivered by a trained music therapist N=20 Music movement therapy including 20 minutes of preparatory activities, 30 minutes of main activities and 10 minutes of finishing activities delivered 3 times per week for 8 weeks. Exercises were completed while people were using wheelchairs while accompanied by meditational music, or when using different musical instruments. This was followed up by people being given a chance to reflect and express their experiences. Concomitant therapy: No additional information
Subgroup 1: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 2: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 3: Group compared to individual sessions of music therapy	Group sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Any combination of the above Interventions where musical instruments are played and receptive interventions in which participants listen to music
Population subgroups	No additional information.
Comparator	No treatment N=20 Routine treatment only Concomitant therapy: No additional information
Number of participants	40.
Duration of follow-up	8 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	Not intention to treat - excludes participants who did not complete the study.

Study arms

Music therapy delivered by a trained music therapist (N = 20)

Music movement therapy including 20 minutes of preparatory activities, 30 minutes of main activities and 10 minutes of finishing activities delivered 3 times per week for 8 weeks. Exercises were completed while people were using wheelchairs while accompanied by meditational music, or when using different musical instruments. This was followed up by people being given a chance to reflect and express their experiences. Concomitant therapy: No additional information

No treatment (N = 20)

Routine treatment only Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	Music therapy delivered by a trained music therapist (N = 20)	No treatment (N = 20)
% Female Sample size	n = 9 ; % = 60	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	60.7 (8.59)	55.1 (17.23)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Music therapy delivered by a trained music therapist (N = 20)	No treatment (N = 20)
Sample size		
Time after stroke Mean (SD)	NR (NR)	NR (NR)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Infarction Sample size	n = 13 ; % = 86.7	n = 12 ; % = 80
Haemorrhage Sample size	n = 2 ; % = 13.3	n = 3 ; % = 20

Outcomes

Study timepoints

- Baseline
- 8 week (End of intervention. <6 months.)

Music therapy delivered by trained music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by a trained music therapist, Baseline, N = 20	Music therapy delivered by a trained music therapist, 8 week, N = 15	No treatment, Baseline, N = 20	No treatment, 8 week, N = 15
Activities of daily living (Korean-Modified Barthel Index) Scale range: 0-100. Change scores. Mean (SD)	52.53 (20.02)	9.2 (4.81)	60.66 (23.44)	7.2 (29.75)
Psychological distress - Depression (Center for Epidemiologic Studies Depression Scale) Scale range: 0-60. Change scores. Mean (SD)	32.06 (11.34)	-6.46 (11.82)	40.4 (13.05)	-9.67 (15.27)

Activities of daily living (Korean-Modified Barthel Index) - Polarity - Higher values are better
Psychological distress - Depression (Center for Epidemiologic Studies Depression Scale) - Polarity - Lower values are better

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

Musictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Activitiesofdailyliving(Korean-ModifiedBarthelIndex)-MeanSD-Music therapy delivered by a trained music therapist-No treatment-t8

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

Musictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(CenterforEpidemiologicStudiesDepressionScale)-MeanSD-Music therapy delivered by a trained music therapist-No treatment-t8

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

Kim, 2011

Bibliographic Reference	Kim, D. S.; Park, Y. G.; Choi, J. H.; Im, S. H.; Jung, K. J.; Cha, Y. A.; Jung, C. O.; Yoon, Y. H.; Effects of music therapy on mood in stroke patients; Yonsei Medical Journal; 2011; vol. 52 (no. 6); 977-81

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	South Korea.
Study setting	Inpatient setting.
Study dates	No additional information.
Sources of funding	The authors have no financial conflicts of interest.
Inclusion criteria	Post-stroke patients, within 6 months of onset and mini mental status examination score of over 20
Exclusion criteria	No additional information
Recruitment / selection of participants	People who were admitted to the Department of Rehabilitation Medicine of Gangnam Severance Hospital.
Intervention(s)	Music therapy delivered by music therapists N=9 Music therapy program following a standard 40-minute format carried out in accordance with the physical strength and individual characteristics of patients. The sessions consisted of a hello song and sharing of events in their lives (5 minutes); planned musical activities (30 minutes) including respiration and phonation, improvised play, hand bell play, singing, songwriting, and expression in tune with music; and share of feelings and a goodbye song (6 minutes). Keyboards, hand bells, percussion instruments, flutes and other tools such as picture cards, flowers and fruit scents were used in accordance with the planned activities. People were encouraged to improvise depending on their feelings and sing children's and folk songs. For 4 weeks. Concomitant therapy: All people received comprehensive rehabilitation treatment including physiotherapy, occupational therapy or speech therapy. All people received regular counselling by a licensed psychotherapist.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 3: Group compared to individual sessions of music therapy	Not stated/unclear
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Interventions where musical instruments are played (including clinical improvisation)
Population subgroups	No additional information.
Comparator	No treatment N=9 No music intervention. Concomitant therapy: All people received comprehensive rehabilitation treatment including physiotherapy, occupational therapy or speech therapy. All people received regular counselling by a licensed psychotherapist.
Number of participants	18.
Duration of follow-up	4 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	ITT (no dropouts).

Study arms

Music therapy delivered by music therapists (N = 9)
Music therapy program following a standard 40-minute format carried out in accordance with the physical strength and individual characteristics of patients. The sessions consisted of a hello song and sharing of events in their lives (5 minutes); planned musical activities (30 minutes) including respiration and phonation, improvised play, hand bell play, singing, songwriting, and expression in tune with music; and share of feelings and a goodbye song (6 minutes). Keyboards, hand bells, percussion instruments, flutes and other tools such as picture cards, flowers and fruit scents were used in accordance with the planned activities. People were encouraged to improvise depending on their feelings and sing children's and folk songs. For 4 weeks. Concomitant therapy: All people received comprehensive rehabilitation treatment including physiotherapy, occupational therapy or speech therapy. All people received regular counselling by a licensed psychotherapist.

No treatment (N = 9)
No music intervention. Concomitant therapy: All people received comprehensive rehabilitation treatment including physiotherapy, occupational therapy or speech therapy. All people received regular counselling by a licensed psychotherapist.

Characteristics

Arm-level characteristics

Characteristic	Music therapy delivered by music therapists (N = 9)	No treatment (N = 9)
% Female Sample size	n = 1 ; % = 11	n = 0 ; % = 0
Mean age (SD) (years) Mean (SD)	51.7 (13.5)	47.3 (11.7)

Characteristic	Music therapy delivered by music therapists (N = 9)	No treatment (N = 9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Mean (SD)	NR (NR)	NR (NR)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints
- Baseline
- 4 week (End of intervention. <6 months.)

Music therapy delivered by music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by music therapists, Baseline, N = 9	Music therapy delivered by music therapists, 4 week, N = 9	No treatment, Baseline, N = 9	No treatment, 4 week, N = 9
Psychological distress - Depression (Beck Depression Inventory) Scale range: 0-63. Final value. Mean (SD)	14.8 (6.4)	12.4 (4.6)	10.9 (2.5)	11.1 (2.5)
Psychological distress - Anxiety (Beck Anxiety Inventory) Scale range: 0-63. Final value. Mean (SD)	9.2 (4)	9 (4.3)	9.2 (4)	9.2 (2.6)

Psychological distress - Depression (Beck Depression Inventory) - Polarity - Lower values are better
Psychological distress - Anxiety (Beck Anxiety Inventory) - Polarity - Lower values are better

Music therapy delivered by music therapists compared to no treatment at <6 months - dichotomous outcome

Outcome	Music therapy delivered by music therapists, Baseline, N = 9	Music therapy delivered by music therapists, 4 week, N = 9	No treatment, Baseline, N = 9	No treatment, 4 week, N = 9
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(BeckDepressionInventory)-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Anxiety(BeckAnxietyInventory)-MeanSD-Music therapy delivered by music therapists-No treatment-t4

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music therapy delivered by music therapists-No treatment-t4

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

Lin, 2017

Bibliographic Reference	Lin, F.; Gu, Y.; Wu, Y.; Huang, D.; He, N.; Effect of music therapy derived from the five elements in Traditional Chinese Medicine on post-stroke depression; Journal of Traditional Chinese Medicine; 2017; vol. 37 (no. 5); 675-680

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	Inpatients
Study dates	March 2014 to February 2015.
Sources of funding	State Administration of Traditional Chinese Medicine of the People's Republic of China, State Clinical Research Base of Traditional Chinese Medicine, The Second Batch of Professional Skill Scientific and Research Special Project (No. JDZX2015127); Jiangsu Natural Science Foundation Youth Project (No. BK20171070); Nanjing Scientific Development Planned Project (No. 201402057)
Inclusion criteria	Met the Chinese and western medicine diagnostic criteria of ischaemic cerebral infarction and were diagnosed with cerebral infarction by skull CT and MRI; met the diagnostic criteria for depression, with a self-rating depression scale and a

	Hamilton's depression scale (HAMD-17) score >7 points; experienced secondary ischaemic cerebral stroke in the acute stage (2 weeks) within 6 months, and had depression symptoms that lasted for >2 weeks; were aged 45-85 years; had stable vital signs and clear consciousness and cooperated with physical examination with adequate communication ability; signed informed consent and voluntarily participated in the study.
Exclusion criteria	Did not meet the diagnostic criteria; experienced ischaemic stroke in the acute stage within 2 weeks or in the sequelae stage >6 months; were >85 years old; had severe diabetes or severe hepatorenal diseases; had unstable vital signs or mental disease; had dementia, disturbance of consciousness and/or aphasia that might have influenced their expression of feelings; had taken antidepressants in the previous 1 month; were allergic to Erigeron breviscapus or sertraline.
Recruitment / selection of participants	People hospitalised in the Department of Neurology in Guangzhou Hospital of Traditional Chinese Medicine
Intervention(s)	Music intervention delivered by healthcare professionals N=30 Acupuncture needling at Baihui (GV20) and acupoint injection at Yanglingquan (GB34) with a five phase music therapy intervention. Music was selected based on the principle of treating emotional disturbance with hyperaffectivity. Acupuncture was conducted during one of the daily music therapy times. Music therapy was administered twice daily, once in the morning and once in the afternoon for 20 minutes per session. All treatments were administered in a 5 day cycle, for three continuous cycles with an interval between two cycles of 1 day (17 days in total). Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to	Individual sessions

individual sessions of music therapy	
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Receptive interventions in which participants listen to music
Population subgroups	No additional information.
Comparator	No treatment N=30 Acupuncture needling only for the same timings. Concomitant therapy: No additional information. A third arm was included in the study: Control N=32 50 mg sertraline hydrochloride tablets (Pfizer Pharmaceutical Co., Ltd.; approval No. H10980141) in the morning - This group was not included in the analysis as they were not comparable to the music intervention arm.
Number of participants	92 (60 in our analysis)
Duration of follow-up	17 days (end of intervention)

Indirectness	No additional information
Additional comments	ITT (no dropouts)

Study arms

Music intervention delivered by healthcare professionals (N = 30)

Acupuncture needling at Baihui (GV20) and acupoint injection at Yanglingquan (GB34) with a five phase music therapy intervention. Music was selected based on the principle of treating emotional disturbance with hyperaffectivity. Acupuncture was conducted during one of the daily music therapy times. Music therapy was administered twice daily, once in the morning and once in the afternoon for 20 minutes per session. All treatments were administered in a 5 day cycle, for three continuous cycles with an interval between two cycles of 1 day (17 days in total). Concomitant therapy: No additional information.

No treatment (N = 30)

Acupuncture needling only for the same timings. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (N = 30)	No treatment (N = 30)
% Female Sample size	n = 13 ; % = 43.33	n = 20 ; % = 66.66
Mean age (SD) (years) Mean (SD)	68.8 (11.5)	72.9 (10.4)

Characteristic	Music intervention delivered by healthcare professionals (N = 30)	No treatment (N = 30)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years) Mean (SD)	NR (NR)	NR (NR)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 17 day (End of intervention. <6 months.)

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcomes

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 30	Music intervention delivered by healthcare professionals, 17 day, N = 30	No treatment, Baseline, N = 30	No treatment, 17 day, N = 30
Activities of daily living (Activities of daily living score) Scale range: Unclear. Change scores. Mean (SD)	36 (17)	18 (5)	33 (22)	12 (5)
Psychological distress - Depression (Hamilton's Depression Scale-17) Scale range: 0-56. Change scores. Mean (SD)	19.8 (3.6)	-6.2 (2.1)	19.5 (4.1)	-4.9 (1.5)

Activities of daily living (Activities of daily living score) - Polarity - Higher values are better
Psychological distress - Depression (Hamilton's Depression Scale-17) - Polarity - Lower values are better

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - dichotomous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 30	Music intervention delivered by healthcare professionals, 17 day, N = 30	No treatment, Baseline, N = 30	No treatment, 17 day, N = 30
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Activitiesofdailyliving(Activitiesofdailylivingscore)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t17

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(Hamilton'sDepressionScale-17)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t17

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by healthcare professionals-No treatment-t17

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

Luft, 2004

Bibliographic Reference	Luft, A. R.; McCombe-Waller, S.; Whitall, J.; Forrester, L. W.; Macko, R.; Sorkin, J. D.; Schulz, J. B.; Goldberg, A. P.; Hanley, D. F.; Repetitive bilateral arm training and motor cortex activation in chronic stroke: a randomized controlled trial; JAMA; 2004; vol. 292 (no. 15); 1853-61

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 States of America
Study setting	Outpatient rehabilitation care in hospital
Study dates	2001 to 2004.
Sources of funding	This study was funded by National Institutes of Health grants from the National Institute on Aging (P60AG 12583); University of Maryland Claude D. Pepper Older Americans Independence Center, National Institute on Disability and Rehabilitation Research (H133G010111); the Baltimore Department of Veterans Affairs Geriatrics Research, Education and Clinical Center (GRECC); National Institute of Neurological Disorders and Stroke 1RO1 NS 24282-08; the France-Merrick Foundation; the Johns Hopkins GCRC (NCRR MO1-00052); and the Eleanor Naylor Dana Charitable Trust, Deutsche Forschungsgemeinschaft (Lu 748/2, 748/3).

Inclusion criteria	Residual upper extremity spastic hemiparesis following a single cortical or subcortical ischaemic stroke; ability to move the affected limb (at least partial range antigravity movement); had completed 3-6 months of conventional rehabilitation therapy; adequate language and neurocognitive function to understand instructions
Exclusion criteria	People with multiple clinical strokes; a history of other neurological disease; chronic pain; emotional disorders.
Recruitment / selection of participants	Conducted as part of the University of Maryland School of Medicine, National Institute on Aging–Claude D. Pepper Older Americans Independence Center in collaboration with the Johns Hopkins University Division of Brain Injury Outcomes. This study took participants from a larger study and completed fMRI scans with them (the larger study could not be identified from this paper).
Intervention(s)	Music intervention delivered by healthcare professionals N=11 Bilateral arm training with rhythmic auditory cueing in hour long therapy sessions (four 5 minute movement periods with 10 minute rest periods between) 3 times per week for 6 weeks. Auditory cues were determined for the individual between 0.67 to 0.97 Hz. Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in	Hospital sessions

hospital compared to delivered in the community	
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information.
Comparator	No treatment N=15 Dose matched therapeutic exercise (same timings). Concomitant therapy: No additional information.
Number of participants	26.
Duration of follow-up	6 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	Not ITT (missing cases were excluded).

Study arms

Music intervention delivered by healthcare professionals (N = 11)

Bilateral arm training with rhythmic auditory cueing in hour long therapy sessions (four 5 minute movement periods with 10 minute rest periods between) 3 times per week for 6 weeks. Auditory cues were determined for the individual between 0.67 to 0.97 Hz.
Concomitant therapy: No additional information.

No treatment (N = 15)

Dose matched therapeutic exercise (same timings). Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (N = 11)	No treatment (N = 15)
% Female Sample size	n = 2 ; % = 22.2	n = 7 ; % = 58.3
Mean age (SD) Mean (SD)	63.3 (15.3)	59.6 (10.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities No of events	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) Median (IQR)	75 (37.9 to 84.5)	45.5 (22.6 to 66.3)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Music intervention delivered by healthcare professionals (N = 11)	No treatment (N = 15)
Cortical Sample size	n = 6 ; % = 66.7	n = 6 ; % = 50
Subcortical Sample size	n = 2 ; % = 22.2	n = 4 ; % = 33.3
Brainstem Sample size	n = 1 ; % = 11.1	n = 2 ; % = 16.7

Outcomes

Study timepoints

- Baseline
- 6 week (End of intervention. <6 months.)

Music interventions delivered by healthcare professionals compared to no treatment at <6 months - continuous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 9	Music intervention delivered by healthcare professionals, 6 week, N = 9	No treatment, Baseline, N = 10	No treatment, 6 week, N = 10
Activities of daily living (University of Maryland Arm Questionnaire for Stroke) Scale range: 0-4 (5 point ordinal scale). Change scores.	NR (NR)	2 (1.4)	NR (NR)	1.7 (2.11)

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 9	Music intervention delivered by healthcare professionals, 6 week, N = 9	No treatment, Baseline, N = 10	No treatment, 6 week, N = 10
Mean (SE)				

Activities of daily living (University of Maryland Arm Questionnaire for Stroke) - Polarity - Higher values are better

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

Musicinterventionsdeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Activitiesofdailyliving(UniversityofMarylandArmQuestionnaireforStroke)-MeanSE-Music intervention delivered by healthcare professionals-No treatment-t6

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

Nayak, 2000

Bibliographic Reference	Nayak, S.; Wheeler, B. L.; Shiflett, S. C.; Agostinelli, S.; Effect of music therapy on mood and social interaction among individuals with acute traumatic brain injury and stroke; Rehabilitation Psychology; 2000; vol. 45 (no. 3); 274-283

1 **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 States of America.
Study setting	Inpatient facility at the Kessler Institute for Rehabilitation.
Study dates	No additional information.
Sources of funding	Support for this research was provided by National Institutes of Health Grant U24-HD32994.
Inclusion criteria	Moderate to severe impairments at admission (defined as an average Functional Independence Measure score of 4.5 or lower and depression score of 4 or higher on the 7-point Faces Scale). If the person's self-reported rating of mood on the Faces Scale did not meet the inclusion cutoff, a family member was also asked to rate their mood and if that value was 4 or higher, the person could enter the study.
Exclusion criteria	People with nasogastric tubes or intravenous lines; uncontrolled agitated behaviour; any serious medical condition; those with sensory, perceptual or marked cognitive impairments that might have interfered with their ability to participate in the study.
Recruitment / selection of participants	No additional information.

Intervention(s)	Music therapy delivered by trained music therapists N=10 Music therapy 3 treatments per week for up to 10 treatments (treatment two or three times per week). A variety of procedures were used based on the needs of the person. Each session began with an opening song or activity. This was frequently some type of instrumental improvisation using simple percussion and melodic instruments. The therapist may structure the improvisation by asking the person to express how they were feeling and for everyone else to play in a manner reflecting their mood. Additional activities could include singing, composing, playing instruments, improvising, performing and listening. Concomitant therapy: Conventional rehabilitation was provided to both groups.
Subgroup 1: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14) Moderate-severe
Subgroup 3: Group compared to individual sessions of music therapy	Group sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Any combination of the above Combination of musical instruments, singing and songwriting

Population subgroups	No additional information
Comparator	No treatment N=8 Standard rehabilitation. Concomitant therapy: No additional information (same as the intervention arm).
Number of participants	18
Duration of follow-up	3 weeks (end of intervention)
Indirectness	People were included who could have had traumatic brain injury or stroke. The number of participants with each is not stated. This study has been included but will be downgraded due to indirectness.
Additional comments	ITT (no dropouts).

Study arms

Music therapy delivered by trained music therapists (N = 10)

Music therapy 3 treatments per week for up to 10 treatments (treatment two or three times per week). A variety of procedures were used based on the needs of the person. Each session began with an opening song or activity. This was frequently some type of instrumental improvisation using simple percussion and melodic instruments. The therapist may structure the improvisation by asking the person to express how they were feeling and for everyone else to play in a manner reflecting their mood. Additional activities could include singing, composing, playing instruments, improvising, performing and listening. Concomitant therapy: Conventional rehabilitation was provided to both groups.

No treatment (N = 8)

Standard rehabilitation. Concomitant therapy: No additional information (same as the intervention arm).

Characteristics

Study-level characteristics

Characteristic	Study (N = 18)
Mean age (SD) (years) Mean (SD)	59.89 (16.3)
Ethnicity Sample size	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR
Time after stroke Mean (SD)	NR (NR)
Severity No of events	n = NR ; % = NR
Type of stroke No of events	n = NR ; % = NR

Arm-level characteristics

Characteristic	Music therapy delivered by trained music therapists (N = 10)	No treatment (N = 8)
% Female Sample size	n = 6 ; % = 60	n = 6 ; % = 75

Outcomes

Study timepoints

- Baseline
- 3 week (End of intervention. <6 months.)

Music therapy delivered by trained music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by trained music therapists, Baseline, N = 10	Music therapy delivered by trained music therapists, 3 week, N = 10	No treatment, Baseline, N = 8	No treatment, 3 week, N = 8
Psychological distress - Depression (Faces Scale) Scale range: 0-7. Final values. Mean (SD)	4.6 (1.71)	2.8 (1.32)	5 (1.41)	3.88 (1.36)
Participation in leisure activities/social groups (Sickness Impact Profile Social Interaction Subscale) Scale range: 0-102. Final values. Mean (SD)	37.6 (7.55)	29.6 (4.5)	44.5 (7.19)	42.88 (8.34)

Psychological distress - Depression (Faces Scale) - Polarity - Lower values are better
Participation in leisure activities/social groups (Sickness Impact Profile Social Interaction Subscale) - Polarity - Lower values are better

Music therapy delivered by trained music therapists compared to no treatment at <6 months - dichotomous outcome

Outcome	Music therapy delivered by trained music therapists, Baseline, N = 10	Music therapy delivered by trained music therapists, 3 week, N = 10	No treatment, Baseline, N = 8	No treatment, 3 week, N = 8
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(FacesScale)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Due to population indirectness)*

Musictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Participationinleisureactivities/socialgroups(SicknessImpactProfileSocialInteractionSubscale)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Due to population indirectness)*

Musictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music therapy delivered by trained music therapists-No treatment-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Due to population indirectness)*

Palumbo, 2022

Bibliographic Reference	Palumbo, Anna; Aluru, Viswanath; Battaglia, Jessica; Geller, Daniel; Turry, Alan; Ross, Marc; Cristian, Adrian; Balagula, Caitlin; Ogedegbe, Gbenga; Khatri, Latika; Chao, Moses V; Froemke, Robert C; Urbanek, Jacek K; Raghavan, Preeti; Music Upper Limb Therapy-Integrated Provides a Feasible Enriched Environment and Reduces Post-stroke Depression: A Pilot Randomized Controlled Trial.; American journal of physical medicine & rehabilitation; 2022; vol. 101 (no. 10); 937-946

1 **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	New York, US.
Study setting	Kingsbrook Jewish Medical Center, a full-service teaching hospital.
Study dates	No additional information.
Sources of funding	This research was supported in part by New York University Clinical Translational Science Award UL1TR000038 from the National Center for Advancing Translational Sciences (NCATS) and U54NS081765, National Institutes of Health, and in part by grants from the GRAMMY Foundation and the John and Jennifer Clay Foundation.
Inclusion criteria	Adults with chronic hemiparesis from a stroke at least 1 month before and the ability to open and close the hand partially with the affected side, suggesting the presence of adequate neural substrate for recovery.
Exclusion criteria	People with hearing deficits that might affect response to music using the Hearing Handicap Inventory for Adults, severe aphasia, cognitive or perceptual deficits including inability to follow directions and attend to task, and motor and ideational apraxia or neglect that would prevent participation in the intervention.
Recruitment / selection of participants	A convenience sample of 30 adults with unilateral hemiparesis post-stroke were recruited from Kingsbrook Jewish Medical Center, a full-service teaching hospital located in a metropolitan area.

Intervention(s)	Music Upper Limb Therapy-Integrated (MULT-I) intervention consists of groups of five participants each which were led collaboratively by one occupational therapist and one music therapist. MULT-I utilized the Nordoff-Robbins approach to music therapy, which incorporates live, interactive music-making. The 45-min intervention was provided twice a week for 6 wks.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Group sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Interventions where musical instruments are played (including clinical improvisation)
Population subgroups	No additional information.
Comparator	Home Exercise Programme (HEP) participants received a packet including photos and written instructions for a HEP consisting of bimanual passive and active assisted range of motion exercises for the upper limb with a cane/stick. The exercises targeted repetitive upper limb movements including shoulder flexion, abduction and adduction, elbow flexion and extension, forearm supination and pronation, and wrist flexion and extension. HEP participants were instructed to perform the exercises for 45 mins twice a week for 6 weeks, matching the dose of physical movements in the MULT-I intervention, and track their sessions on a tracking sheet.

Number of participants	15
Duration of follow-up	6 weeks.
Indirectness	Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.
Additional comments	No additional comments.

Study arms

Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]) (N = 15)
The MULT-I intervention consists of groups of five participants each which were led collaboratively by one occupational therapist and one music therapist. MULT-I utilized the Nordoff-Robbins approach to music therapy, which incorporates live, interactive music-making. The 45-min intervention was provided twice a week for 6 wks.

No treatment (Home exercise programme [HEP]) (N = 15)
HEP participants received a packet including photos and written instructions for a HEP consisting of bimanual passive and active assisted range of motion exercises for the upper limb with a cane/stick. The exercises targeted repetitive upper limb movements including shoulder flexion, abduction and adduction, elbow flexion and extension, forearm supination and pronation, and wrist flexion and extension. HEP participants were instructed to perform the exercises for 45 mins twice a week for 6 weeks, matching the dose of physical movements in the MULT-I intervention, and track their sessions on a tracking sheet.

1 **Characteristics**

2 ***Arm-level characteristics***

Characteristic	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]) (N = 15)	No treatment (Home exercise programme [HEP]) (N = 15)
% Female Sample size	n = NR ; % = 61.54	n = NR ; % = 33.33
Age Mean (SD)	61.23 (9.13)	61.75 (12.75)
Ethnic group Sample size	n = NR ; % = 92.31	n = NR ; % = 83.33
Comordities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Mean (SD)	12.85 (18.45)	28.5 (31.92)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke No of events	n = NR ; % = NR	n = NR ; % = NR

3

Outcomes

Study timepoints

- Baseline
- 6 week (< 6 months)

Music upper limb therapy-integrated versus home exercise programme at < 6 months - continuous outcomes

Outcome	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), Baseline, N = 13	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), 6 week, N = 13	No treatment (Home exercise programme [HEP]), Baseline, N = 12	No treatment (Home exercise programme [HEP]), 6 week, N = 9
Psychological distress - depression (Patient Health Questionnaire (PHQ)-9) Scale range: 0-27. Final values. Mean (SD)	8.31 (6.34)	3.15 (3)	4.25 (4.39)	3.44 (5.7)

Psychological distress - depression (Patient Health Questionnaire (PHQ)-9) - Polarity - Lower values are better

Music upper limb therapy-integrated versus home exercise programme at < 6 months - continuous outcomes

Outcome	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), Baseline, N = 13	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), 6 week, N = 13	No treatment (Home exercise programme [HEP]), Baseline, N = 12	No treatment (Home exercise programme [HEP]), 6 week, N = 12
Stroke-specific Patient-Reported Outcome Measures (Stroke	NR (NR)	NR (NR)	NR (NR)	NR (NR)

Outcome	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), Baseline, N = 13	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), 6 week, N = 13	No treatment (Home exercise programme [HEP]), Baseline, N = 12	No treatment (Home exercise programme [HEP]), 6 week, N = 12
Impact Scale) Scale range: 0-100. Final values. Mean (SD)				
SIS Physical strength Mean (SD)	27.31 (16.41)	38.46 (14.05)	38.33 (17.62)	49.17 (18.93)
SIS Activities Mean (SD)	36.92 (17.68)	46.94 (17.67)	47.5 (13.99)	53.33 (17.44)
SIS Mobility Mean (SD)	34.36 (21.99)	47.69 (22.66)	55.37 (18.24)	58.7 (15.9)
SIS Hand use Mean (SD)	8.62 (18.1)	19.08 (25.04)	16 (21.37)	31 (30.04)
SIS Memory Mean (SD)	64.62 (16.56)	70.11 (15.19)	68.33 (19.66)	71.19 (17.34)
SIS Emotions Mean (SD)	53.5 (11.17)	60.51 (13.76)	60.74 (14.47)	58.89 (14.17)
SIS Communications Mean (SD)	68.35 (16.06)	71.43 (15.56)	73.1 (14.23)	73.57 (14.16)

Outcome	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), Baseline, N = 13	Music therapy delivered by trained music therapists (Music upper limb therapy-integrated [MULT-I]), 6 week, N = 13	No treatment (Home exercise programme [HEP]), Baseline, N = 12	No treatment (Home exercise programme [HEP]), 6 week, N = 12
SIS Participation Mean (SD)	25.28 (13.67)	46.54 (17.52)	45.27 (16.76)	55 (19.45)
SIS Recovery Mean (SD)	48.46 (16.12)	61.54 (12.65)	57.25 (13.88)	62.75 (18.48)
Wellbeing Scores (World Health Oragnisation (WHO-5), five item well-being index) (five item well-being index) Scale range: 0-25. Final values. Mean (SD)	17.77 (7.32)	21.46 (4.31)	18.83 (5.13)	19.08 (5.96)

Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Polarity - Higher values are better
Wellbeing Scores (World Health Oragnisation (WHO-5), five item well-being index) - Polarity - Higher values are better

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

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-Psychologicaldistress-depression-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment, baseline differences, and unexplained loss of participants in control group)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISPhysicalstrength-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISActivities-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISMobility-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISHanduse-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISMemory-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISEmotions-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISCommunications-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISParticipation-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-SISRecovery-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Musicupperlimbtherapy-integratedversushomeexerciseprogrammeat<6months-continuousoutcomes-WellbeingScores-MeanSD-Music upper limb therapy-integrated (MULT-I)-Home exercise programme (HEP)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(No information on allocation concealment and baseline differences)*
Overall bias and Directness	Overall Directness	Partially applicable *(Comparator indirectness (does not match protocol) and unclear if exercises in comparator group were the same as those used in the intervention group.)*

Pocwierz-Marciniak, 2017

Bibliographic Reference	Pocwierz-Marciniak, Ilona; Bidzan, Mariola; The influence of music therapy on quality of life after a stroke; Health psychology report; 2017; vol. 5 (no. 2); 173-185

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	Gdynia (Northern Poland).
Study setting	Inpatient neurological rehabilitation in hospital.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	First episode of stroke (ischaemic or haemorrhagic); presence of a motor disability; absence of evident cognitive or executive disorders; a score of at least 27 points on the Mini-Mental State Examination; a score of at least 16 points on the Frontal Assessment battery.
Exclusion criteria	No additional information.
Recruitment / selection of participants	No additional information.
Intervention(s)	Neurologic music therapy delivered by trained music therapists N=30 One-to-one sessions using mainly a receptive approach based on cognitive music therapy and guided imagery and music. Classical and film music compositions were used. This took place twice a week and was identical for each patient, involving 10 meetings which followed the same pattern. Each session was divided into three parts: an introduction, which involved describing the patient's current mood and doing breathing exercises while listening to music or using their voice; the main part, including addressing the session's main theme while listening to music, conversation and psychoeducational activities as well as music therapy exercises; and the final part, which consists of relaxation while listening to music and a summing-up of the conversation. The themes addressed were grouped into three cycles: "Around the illness", "Around emotions" and "Around interpersonal relations". Concomitant therapy: All people were undergoing an inpatient neurological rehabilitation in hospital and receiving standard care, including physiotherapy, ergotherapy, psychological diagnosis and maintenance psychotherapy.
Subgroup 1: Time after stroke at the start of the trial	Acute (72 hours - 7 days) Assumed as inpatient rehabilitation

Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Receptive interventions in which participants listen to music
Population subgroups	No additional information
Comparator	No treatment N=31 No listening materials. Concomitant therapy: All people were undergoing an inpatient neurological rehabilitation in hospital and receiving standard care, including physiotherapy, ergotherapy, psychological diagnosis and maintenance psychotherapy.
Number of participants	61
Duration of follow-up	5 weeks (end of intervention)
Indirectness	No additional information

Additional comments	ITT (no dropouts) - does not explicitly mention this but all people appear to be accounted for and does not mention any participant withdrawal. This study reports multiple measures for quality of life (SF-36 and the Cantril Ladder). As per the protocol, we only extracted the values for SF-36 as this was a high priority measure.

Study arms

Neurologic music therapy delivered by trained music therapists (N = 30)

One-to-one sessions using mainly a receptive approach based on cognitive music therapy and guided imagery and music. Classical and film music compositions were used. This took place twice a week and was identical for each patient, involving 10 meetings which followed the same pattern. Each session was divided into three parts: an introduction, which involved describing the patient's current mood and doing breathing exercises while listening to music or using their voice; the main part, including addressing the session's main theme while listening to music, conversation and psychoeducational activities as well as music therapy exercises; and the final part, which consists of relaxation while listening to music and a summing-up of the conversation. The themes addressed were grouped into three cycles: "Around the illness", "Around emotions" and "Around interpersonal relations". Concomitant therapy: All people were undergoing an inpatient neurological rehabilitation in hospital and receiving standard care, including physiotherapy, ergotherapy, psychological diagnosis and maintenance psychotherapy.

No treatment (N = 31)

No listening materials. Concomitant therapy: All people were undergoing an inpatient neurological rehabilitation in hospital and receiving standard care, including physiotherapy, ergotherapy, psychological diagnosis and maintenance psychotherapy.

Characteristics

Arm-level characteristics

Characteristic	Neurologic music therapy delivered by trained music therapists (N = 30)	No treatment (N = 31)
% Female	n = 16 ; % = 53.3	n = 15 ; % = 51.6

Characteristic	Neurologic music therapy delivered by trained music therapists (N = 30)	No treatment (N = 31)
Sample size		
Mean age (SD) (years) Range	44 to 84	47 to 84
Mean age (SD) (years) Mean (SD)	65 (NR)	63 (NR)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Mean (SD)	NR (NR)	NR (NR)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Ischaemic Sample size	n = 22 ; % = 73.3	n = 27 ; % = 87.1
Haemorrhagic Sample size	n = 8 ; % = 26.7	n = 4 ; % = 12.9

Outcomes

Study timepoints

- Baseline
- 5 week (End of follow up. <6 months.)

Neurologic music therapy delivered by trained music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Neurologic music therapy delivered by trained music therapists, Baseline, N = 30	Neurologic music therapy delivered by trained music therapists, 5 week, N = 30	No treatment, Baseline, N = 31	No treatment, 5 week, N = 31
Person/participant generic health-related quality of life (SF-36) Scale range: 0-100. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Physical functioning Mean (SD)	12.93 (3.01)	17.43 (4.73)	13.19 (4.22)	16 (5.38)
Physical limitations (role physical) Mean (SD)	4.23 (0.5)	5 (1.05)	4.32 (0.83)	4.71 (0.94)
Bodily pain Mean (SD)	8.53 (2.1)	8.63 (2.31)	7.23 (2.91)	8.16 (2.67)
General health perceptions Mean (SD)	14.33 (3.69)	17.43 (3.1)	15.32 (3.44)	15.97 (3.7)

Outcome	Neurologic music therapy delivered by trained music therapists, Baseline, N = 30	Neurologic music therapy delivered by trained music therapists, 5 week, N = 30	No treatment, Baseline, N = 31	No treatment, 5 week, N = 31
Vitality Mean (SD)	14.03 (3.83)	18.63 (3.19)	12.61 (4.29)	14.52 (3.84)
Social functioning Mean (SD)	5.73 (2.27)	7.37 (1.87)	5.97 (2.86)	6.81 (2.47)
Emotional limitations (role emotional) Mean (SD)	5.03 (1.27)	5.83 (0.53)	4.52 (1.36)	5 (1.29)
Mental health Mean (SD)	20.03 (5.33)	24.23 (3.67)	18.23 (6.68)	20.48 (5.81)
Stroke-specific Patient Reported Outcome Measures (Stroke adjusted Sickness Impact Profile 30) Scale range: 0-68. Final values. Mean (SD)	20.8 (4.26)	14.9 (4.62)	19.48 (4.24)	16.42 (4.63)

Person/participant generic health-related quality of life (SF-36) - Polarity - Higher values are better
Stroke-specific Patient Reported Outcome Measures (Stroke adjusted Sickness Impact Profile 30) - Polarity - Lower values are better

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Physicalfunctioning-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Physicallimitations(rolephysical)-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Bodilypain-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Generalhealthperceptions-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Vitality-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Socialfunctioning-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Emotionallimitations(roleemotional)-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Mentalhealth-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Neurologicmusictherapydeliveredbytrainedmusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Stroke-specificPatientReportedOutcomeMeasures(StrokeadjustedSicknessImpactProfile30)-MeanSD-Neurologic music therapy delivered by trained music therapists-No treatment-t5

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

Raglio, 2021

Bibliographic Reference	Raglio, A.; Panigazzi, M.; Colombo, R.; Tramontano, M.; Iosa, M.; Mastrogiacomo, S.; Baiardi, P.; Molteni, D.; Baldissarro, E.; Imbriani, C.; Imarisio, C.; Eretti, L.; Hamedani, M.; Pistarini, C.; Imbriani, M.; Mancardi, G. L.; Caltagirone, C.; Hand rehabilitation with sonification techniques in the subacute stage of stroke; Scientific Reports; 2021; vol. 11 (no. 1); 7237

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	NCT03306797.
Study type	Randomised controlled trial (RCT)
Study location	Italy
Study setting	Rehabilitation units (outpatient follow up).
Study dates	March 27th 2017 to April 15th 2019
Sources of funding	This work was partially supported by the "Ricereca Corrente" funding provided by the Italian Ministry of Health.
Inclusion criteria	Age 40-85 years; ischaemic lesion in a single hemisphere (right or left hemiplegia/hemiparesis); clinically evaluable residual movement capacity of the paretic upper limb (ability to autonomously make postural adjustments during reaching tasks); Mini Mental State Examination >24; acute onset no more than 180 days prior to enrollment in the study.

Exclusion criteria	Presence of neglect (evaluated through a clinical and functional assessment); previous or concomitant diseases affecting upper limb functions (e.g. Parkinson's disease, multiple sclerosis, shoulder periarthritis, Dupuytren's disease ect.); rehabilitation treatments with music in the last year.
Recruitment / selection of participants	People were recruited in 5 Italian rehabilitative units located at Maugeri Scientific Clinical Institutes of Pavia, Montescano and Nervi, S. Lucia Foundation IRCCS (Rome) and Neurological Clinic of S. Martino Hospital (University of Genoa).
Intervention(s)	Music interventions delivered by healthcare professionals N=33 Sonofication - properly selected set of sonorous-music stimuli activated by patient's movements with the mediation of a sensor (the Leap Motion Controller). Synthesized sounds/musical texture and their parameters (mainly rhythm, pitch/melody, intensity/dynamics, harmony and timbre) are used to represent movements characteristics, especially from a temporal and spatial point of view. Delivered as 35 minute sessions (passive treatment without sonification for 15 minutes, and a second phase for 20 minutes in which motor exercises were supported by sonofication techniques). Delivered by physiotherapists or occupational therapists 5 days a week for 4 weeks, for a total of 20 sessions. Concomitant therapy: All people received usual care for people with subacute strokes (such as occupational therapy, speech therapy, psychological support, lower extremity rehabilitation ect.). All people received standard motor exercises (with or without sonofication). The first phase included passive treatment (15 minutes) while the second phase included active movements (20 minutes).
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to	Individual sessions

individual sessions of music therapy	
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Other Sonofication - synthesizer connected to the movements of the individual
Population subgroups	No additional information.
Comparator	No treatment N=32 No music intervention. Concomitant therapy: All people received usual care for people with subacute strokes (such as occupational therapy, speech therapy, psychological support, lower extremity rehabilitation ect.). All people received standard motor exercises (with or without sonofication). The first phase included passive treatment (15 minutes) while the second phase included active movements (20 minutes).
Number of participants	65
Duration of follow-up	4 weeks of intervention, 1 month of additional follow up (2 months in total).
Indirectness	No additional information.
Additional comments	ITT and per-protocol. ITT data does not report the 2 month follow up, so per-protocol analysis needs to be used.

1

Study arms

Music interventions delivered by healthcare professionals (N = 33)
Sonofication - properly selected set of sonorous-music stimuli activated by patient's movements with the mediation of a sensor (the Leap Motion Controller). Synthesized sounds/musical texture and their parameters (mainly rhythm, pitch/melody, intensity/dynamics, harmony and timbre) are used to represent movements characteristics, especially from a temporal and spatial point of view. Delivered as 35 minute sessions (passive treatment without sonification for 15 minutes, and a second phase for 20 minutes in which motor exercises were supported by sonofication techniques). Delivered by physiotherapists or occupational therapists 5 days a week for 4 weeks, for a total of 20 sessions. Concomitant therapy: All people received usual care for people with subacute strokes (such as occupational therapy, speech therapy, psychological support, lower extremity rehabilitation ect.). All people received standard motor exercises (with or without sonofication). The first phase included passive treatment (15 minutes) while the second phase included active movements (20 minutes).

No treatment (N = 32)
No music intervention. Concomitant therapy: All people received usual care for people with subacute strokes (such as occupational therapy, speech therapy, psychological support, lower extremity rehabilitation ect.). All people received standard motor exercises (with or without sonofication). The first phase included passive treatment (15 minutes) while the second phase included active movements (20 minutes).

Characteristics

Arm-level characteristics

Characteristic	Music interventions delivered by healthcare professionals (N = 33)	No treatment (N = 32)
% Female Sample size	n = 14 ; % = 46.8	n = 16 ; % = 48.5
Mean age (SD) (years) Mean (SD)	64.7 (16)	62.4 (8.9)

Characteristic	Music interventions delivered by healthcare professionals (N = 33)	No treatment (N = 32)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (days) Interquartile Range	31.75	38.25
Time after stroke (days) Median Min-Max	29.5 (13 to 180)	34.5 (12 to 180)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 2 month (1 month after the intervention finished (reported as T3 in the supplementary information). <6 months.)

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcome

Outcome	**Music interventions delivered by healthcare professionals, Baseline, N = 13**	**Music interventions delivered by healthcare professionals, 2 month, N = 13**	**No treatment, Baseline, N = 16**	**No treatment, 2 month, N = 16**
Person/participant generic health-related quality of life (McGill Quality of Life) Scale range: 0-10. Final values. Mean (SD)	6.29 (1.67)	6.85 (1.81)	6.81 (1.44)	7.34 (1.24)

Person/participant generic health-related quality of life (McGill Quality of Life) - Polarity - Higher values are better

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - dichotmous outcome

Outcome	**Music interventions delivered by healthcare professionals, Baseline, N = 33**	**Music interventions delivered by healthcare professionals, 2 month, N = 33**	**No treatment, Baseline, N = 32**	**No treatment, 2 month, N = 32**
Withdrawal due to adverse events Intervention: 1 hospitalised, 3 worsening of clinical condition. Control: 3 worsening of clinical condition. No of events	n = NA ; % = NA	n = 4 ; % = 12.1	n = NA ; % = NA	n = 3 ; % = 9.38

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Person/participantgenerichealth-relatedqualityoflife(McGillQualityofLife)-MeanSD-Music interventions delivered by healthcare professionals-No treatment-t2

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotmousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music interventions delivered by healthcare professionals-No treatment-t2

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

Raglio, 2017

Bibliographic Reference	Raglio, A.; Zaliani, A.; Baiardi, P.; Bossi, D.; Sguazzin, C.; Capodaglio, E.; Imbriani, C.; Gontero, G.; Imbriani, M.; Active music therapy approach for stroke patients in the post-acute rehabilitation; Neurological Sciences; 2017; vol. 38 (no. 5); 893-897

1 **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	Italy.
Study setting	Inpatients.
Study dates	No additional information.
Sources of funding	The authors received no financial support for the research, authorship, and/or publication of this article.
Inclusion criteria	Mini Mental State examination at least 18; age at least 40 years; stable clinical condition; absence of other neurologic and psychiatric diseases; sufficient autonomy in motor functions of upper limbs to use musical instruments, including in the music therapy setting; cooperation during music therapy interaction.
Exclusion criteria	People with a total aphasia; amusia; previous neurological or psychiatric diseases; those who underwent previous music therapy treatments or musical training or practice
Recruitment / selection of participants	People were recruited immediately after the acute phase (during a rehabilitation period of 6-8 weeks).
Intervention(s)	Music therapy delivered by trained music therapists N=19

	Relational active music therapy approach using rhythmical-melodic instrumentation (i.e. xylophones, glockenspiels, drums, bongos, ethnic percussions ect.) in a non-verbal setting. The music therapist invites people to play an active role and to interact using musical instruments. 20 sessions lasting 30 minutes each, three weekly (duration = around 7 weeks). Concomitant therapy: The standard of care treatment consisted of daily sessions of physiotherapy (passive/assisted active mobilization and neurorehabilitative techniques of paretic upper limbs, coordination and balance exercises, and gait training) and occupational therapy (exercises improving fine motor skills and recovering activities of daily living).
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Interventions where musical instruments are played (including clinical improvisation)
Population subgroups	No additional information.

Comparator	No treatment N=19 No music intervention. Concomitant therapy: The standard of care treatment consisted of daily sessions of physiotherapy (passive/assisted active mobilization and neurorehabilitative techniques of paretic upper limbs, coordination and balance exercises, and gait training) and occupational therapy (exercises improving fine motor skills and recovering activities of daily living).
Number of participants	38
Duration of follow-up	7 weeks (end of intervention).
Indirectness	No additional information.
Additional comments	No additional information (no statement about dropout).

Study arms

Music therapy delivered by trained music therapists (N = 19)
Relational active music therapy approach using rhythmical-melodic instrumentation (i.e. xylophones, glockenspiels, drums, bongos, ethnic percussions ect.) in a non-verbal setting. The music therapist invites people to play an active role and to interact using musical instruments. 20 sessions lasting 30 minutes each, three weekly (duration = around 7 weeks). Concomitant therapy: The standard of care treatment consisted of daily sessions of physiotherapy (passive/assisted active mobilization and neurorehabilitative techniques of paretic upper limbs, coordination and balance exercises, and gait training) and occupational therapy (exercises improving fine motor skills and recovering activities of daily living).

No treatment (N = 19)

No music intervention. Concomitant therapy: The standard of care treatment consisted of daily sessions of physiotherapy (passive/assisted active mobilization and neurorehabilitative techniques of paretic upper limbs, coordination and balance exercises, and gait training) and occupational therapy (exercises improving fine motor skills and recovering activities of daily living).

Characteristics

Arm-level characteristics

Characteristic	Music therapy delivered by trained music therapists (N = 19)	No treatment (N = 19)
% Female Sample size	n = 11 ; % = 58	n = 11 ; % = 58
Mean age (SD) (years) Mean (SD)	70.4 (8.9)	75.4 (7.6)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Mean (SD)	NR (NR)	NR (NR)
Severity Mean (SD)	4.63 (2.29)	5.05 (2.27)

Characteristic	Music therapy delivered by trained music therapists (N = 19)	No treatment (N = 19)
Type of stroke Sample size	n = NA	n = NA ; % = NA
Ischaemic Sample size	n = 17 ; % = 89.5	n = 18 ; % = 94.7
Haemorrhagic Sample size	n = 2 ; % = 10.5	n = 1 ; % = 5.3
Aphasia Sample size	n = 1 ; % = 5.3	n = 1 ; % = 5.3
Dysarthria Sample size	n = 9 ; % = 47.4	n = 8 ; % = 42.1

Outcomes

Study timepoints

- Baseline
- 7 week (End of intervention. <6 months.)

Music therapy delivered by music therapists compared to no treatment at <6 months - continuous outcomes

Outcome	Music therapy delivered by trained music therapists, Baseline, N = 19	Music therapy delivered by trained music therapists, 7 week, N = 19	No treatment, Baseline, N = 19	No treatment, 7 week, N = 19
Person/participant generic health-related quality of life (McGill Quality of Life) Scale range: 0-10. Final values. Mean (SD)	6.8 (1.88)	7.76 (1.34)	7.27 (1.86)	7.49 (1.68)
Psychological distress - Depression (HADS-D) Scale range: 0-42. Final values. Mean (SD)	7.18 (4.89)	4.47 (3.57)	3.8 (3.6)	4.33 (3.11)
Psychological distress - Anxiety (HADS-A) Scale range: 0-42. Final values. Mean (SD)	6.17 (4.29)	4.83 (3.5)	5.8 (3.69)	5.73 (3.97)
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	76.58 (20.35)	110.47 (9.9)	71.26 (19.33)	106.89 (16.83)

Person/participant generic health-related quality of life (McGill Quality of Life) - Polarity - Higher values are better
Psychological distress - Depression (HADS-D) - Polarity - Lower values are better
Psychological distress - Anxiety (HADS-A) - Polarity - Lower values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(McGillQualityofLife)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t7

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Depression(HADS-D)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t7

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Psychologicaldistress-Anxiety(HADS-A)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t7

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

Musictherapydeliveredbymusictherapistscomparedtonotreatmentat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Music therapy delivered by trained music therapists-No treatment-t7

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

Tarrant, 2018

Bibliographic Reference	Tarrant, M.; Carter, M.; Dean, S. G.; Taylor, R. S.; Warren, F. C.; Spencer, A.; Adamson, J.; Landa, P.; Code, C.; Calitri, R.; Singing for people with aphasia (SPA): a protocol for a pilot randomised controlled trial of a group singing intervention to improve well-being; BMJ Open; 2018; vol. 8 (no. 9); e025167

Study details

Secondary publication of another included study- see primary study for details	Tarrant, M., Carter, M., Dean, S. G. et al. (2021) Singing for people with aphasia (SPA): results of a pilot feasibility randomised controlled trial of a group singing intervention investigating acceptability and feasibility. BMJ Open 11(1): e040544
Other publications associated with this study included in review	No additional information

Tarrant, 2021

Bibliographic Reference	Tarrant, M.; Carter, M.; Dean, S. G.; Taylor, R.; Warren, F. C.; Spencer, A.; Adamson, J.; Landa, P.; Code, C.; Backhouse, A.; Lamont, R. A.; Calitri, R.; Singing for people with aphasia (SPA): results of a pilot feasibility randomised controlled trial of a group singing intervention investigating acceptability and feasibility; BMJ Open; 2021; vol. 11 (no. 1); e040544

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	Tarrant, M., Carter, M., Dean, S. G. et al. (2018) Singing for people with aphasia (SPA): a protocol for a pilot randomised controlled trial of a group singing intervention to improve well-being. BMJ Open 8(9): e025167
Study type	Randomised controlled trial (RCT) Mixed methods including an RCT and qualitative data
Study location	United Kingdom
Study setting	Three community settings: a church hall, a community centre and a dedicated music venue.
Study dates	May 2017 and April 2018.
Sources of funding	The trial is funded by the Stroke Association (QQ12/TSA 2016/14). Excess treatment costs have been covered by South Devon and Torbay Clinical Commissioning Group, North East and West Devon Clinical Commissioning group and the University of Exeter Medical School. The report is independent research supported by the National Institute for Health Research Applied Research Collaboration South West Peninsula.
Inclusion criteria	Diagnosis of aphasia following a stroke (confirmed by general practitioners); willingness to be randomised to either intervention and attend the intervention venue; conversational English pre-stroke; capacity to consent to participate

Exclusion criteria	Under the age of 18 years old; currently attending a speech and language therapy; intended to relocate outside of the geographic region; participatingin another group intervention study; currently attending an existing singing or music group
Recruitment / selection of participants	Several routes: the South West Peninsula Clinical Research Network (Stroke); through speech and language therapists who provided study information and patient information sheets to potential participants; advertising through local support groups and on relevant websites; via local stroke support networks identified through national organisations (eg, the Stroke Association and Different strokes) and word of mouth, study flyers, adverts and information sheets placed in community settings and on the host university website.
Intervention(s)	Music intervention delivered by non-healthcare professionals N=20 Singing for people with aphasia intervention consisting of 10 weekly sessions delivered in a community facility across three sites in the South-West of England, with each session lasting 90 minutes. Sessions comprised approximately 45 minutes of group singing, with 45 minutes allocated to settling in/warm-up, mid-session break and departure. Three separate venues were used: a church hall, a community centre and a dedicated music venue. All venues were arranged such that there were separate singing and social areas. The sessions were facilitated by one of two experienced community music leaders who also provided music accompaniment (keyboard or guitar) and were supported by a 'singing champion'. Both facilitator and champion ran all sessions for their assigned group/s which ranged from six to seven participants. Small auxiliary percussion instruments were available for participants to play, and supported the engagement of participants with limited singing ability. Session content was flexible and included a range of songs, mainly popular 'classics', suggested by both facilitator and participants. Each group worked toward a final activity, either the development of a 'playlist' or a performance for family/friends to be delivered in the last session. Carers were welcome to support participants and joint in with the singing programme. The intervention was manualised and facilitators were trained in communication with people with aphasia. Concomitant therapy: All people received a resource pack in aphasia-friendly format, constructed for the purpose of the study, which provided information on living with aphasia and the available local community services.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as	Mild (or NIHSS 1-5) Based on mean aphasia severity

measured by NIHSS scale)	
Subgroup 3: Group compared to individual sessions of music therapy	Group sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Community sessions
Subgroup 5: Type of intervention	Singing and music-based voice interventions
Population subgroups	No additional information
Comparator	No treatment N=21 No additional treatment. Concomitant therapy: All people received a resource pack in aphasia-friendly format, constructed for the purpose of the study, which provided information on living with aphasia and the available local community services.
Number of participants	41
Duration of follow-up	3 months and 6 months
Indirectness	Outcome indirectness - the adverse events outcome include serious adverse events rather than withdrawal due to adverse events (as this was not clearly stated).

Additional comments	Intention to tread - whereby participants were analysed according to their allocated group irrespective of the treatment received. Observed data only were used for the analysis, with no use of methods to address missing data (such as multiple imputation).

Study arms

Music intervention delivered by non-healthcare professionals (N = 20)

Singing for people with aphasia intervention consisting of 10 weekly sessions delivered in a community facility across three sites in the South-West of England, with each session lasting 90 minutes. Sessions comprised approximately 45 minutes of group singing, with 45 minutes allocated to settling in/warm-up, mid-session break and departure. Three separate venues were used: a church hall, a community centre and a dedicated music venue. All venues were arranged such that there were separate singing and social areas. The sessions were facilitated by one of two experienced community music leaders who also provided music accompaniment (keyboard or guitar) and were supported by a 'singing champion'. Both facilitator and champion ran all sessions for their assigned group/s which ranged from six to seven participants. Small auxiliary percussion instruments were available for participants to play, and supported the engagement of participants with limited singing ability. Session content was flexible and included a range of songs, mainly popular 'classics', suggested by both facilitator and participants. Each group worked toward a final activity, either the development of a 'playlist' or a performance for family/friends to be delivered in the last session. Carers were welcome to support participants and joint in with the singing programme. The intervention was manualised and facilitators were trained in communication with people with aphasia. Concomitant therapy: All people received a resource pack in aphasia-friendly format, constructed for the purpose of the study, which provided information on living with aphasia and the available local community services.

No treatment (N = 21)

No additional treatment. Concomitant therapy: All people received a resource pack in aphasia-friendly format, constructed for the purpose of the study, which provided information on living with aphasia and the available local community services.

1 **Characteristics**

2 ***Arm-level characteristics***

Characteristic	Music intervention delivered by non-healthcare professionals (N = 20)	No treatment (N = 21)
% Female Sample size	n = 8 ; % = 40	n = 8 ; % = 38
Mean age (SD) (years) Mean (SD)	65.2 (12.2)	67.7 (8.3)
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA
White Sample size	n = 20 ; % = 100	n = 19 ; % = 90
Black Sample size	n = 0 ; % = 0	n = 1 ; % = 5
Asian Sample size	n = 0 ; % = 0	n = 1 ; % = 1
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years) Mean (SD)	4.6 (3.8)	5.6 (6.7)

Characteristic	Music intervention delivered by non-healthcare professionals (N = 20)	No treatment (N = 21)
Severity Aphasia severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Mild Sample size	n = 14 ; % = 70	n = 13 ; % = 62
Moderate Sample size	n = 3 ; % = 15	n = 4 ; % = 19
Severe Sample size	n = 3 ; % = 15	n = 4 ; % = 19
Type of stroke No of events	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 month (<6 months)
- 6 month (≥6 months)

Music intervention delivered by non-healthcare professionals compared to no treatment at <6 months and ≥6 months - continuous outcomes

Outcome	Music intervention delivered by non-healthcare professionals, Baseline, N = 20	Music intervention delivered by non-healthcare professionals, 3 month, N = 17	Music intervention delivered by non-healthcare professionals, 6 month, N = 18	No treatment, Baseline, N = 21	No treatment, 3 month, N = 19	No treatment, 6 month, N = 16
Person/participant generic health-related quality of life (EQ-5D-5L) Scale range: -0.11-1. Final values. Mean (SD)	0.71 (0.24)	0.68 (0.27)	0.75 (0.24)	0.73 (0.16)	0.73 (0.24)	0.65 (0.24)
Carer generic health-related quality of life (CarerQoL-7D) Scale range: 0-14. Final values. Mean (SD)	9.2 (2.3)	NR (NR)	9 (2.7)	9.6 (2.6)	NR (NR)	9 (3.1)
Wellbeing scores (ICEpop CAPability measure for adults) Scale range: 0-1. Final values. Mean (SD)	0.83 (0.12)	0.82 (0.096)	0.81 (0.1)	0.76 (0.16)	0.75 (0.82)	0.78 (0.16)
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life Scale)	3.6 (0.8)	3.6 (0.8)	3.7 (0.8)	3.5 (0.6)	3.6 (0.7)	3.4 (0.7)

Outcome	Music intervention delivered by non-healthcare professionals, Baseline, N = 20	Music intervention delivered by non-healthcare professionals, 3 month, N = 17	Music intervention delivered by non-healthcare professionals, 6 month, N = 18	No treatment, Baseline, N = 21	No treatment, 3 month, N = 19	No treatment, 6 month, N = 16
Scale range: 1-5. Final values. Mean (SD)						
Participation in leisure activites/social groups scores (modified Reintegration to Normal Living Index) Scale range: 0-100. Final values. Mean (SD)	20.4 (7.1)	23.1 (5.3)	23.9 (6.2)	20.1 (6.7)	22.1 (8)	22.1 (7.5)

Person/participant generic health-related quality of life (EQ-5D-5L) - Polarity - Higher values are better
Carer generic health-related quality of life (CarerQoL-7D) - Polarity - Higher values are better
Wellbeing scores (ICEpop CAPability measure for adults) - Polarity - Higher values are better
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life Scale) - Polarity - Higher values are better
Participation in leisure activites/social groups scores (modified Reintegration to Normal Living Index) - Polarity - Higher values are better

Music intervention delivered by non-healthcare professionals compared to no treatment at <6 months and ≥6 months - dichotomous outcome

Outcome	Music intervention delivered by non-healthcare professionals, Baseline, N = 20	Music intervention delivered by non-healthcare professionals, 3 month, N = 20	Music intervention delivered by non-healthcare professionals, 6 month, N = 20	No treatment, Baseline, N = 21	No treatment, 3 month, N = 21	No treatment, 6 month, N = 21
Serious adverse events The study does not report withdrawal due to adverse events. However, this will be included as indirect evidence. Events: Intervention arm: 1 person (fall and death), 1 person (lung infection and fall). Control: No events. Data reported overall but to avoid double counting has been counted at the 3 month period. No of events	n = NA ; % = NA	n = 2 ; % = 10	n = NA ; % = NA	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA

Serious adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t6

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Carergenerichealth-relatedqualityoflife(CarerQoL-7D)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t6

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Wellbeingscores(ICEpopCAPabilitymeasureforadults)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t3

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Wellbeingscores(ICEpopCAPabilitymeasureforadults)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t6

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeandAphasiaQualityofLifeScale)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t3

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeandAphasiaQualityofLifeScale)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t6

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Participationinleisureactivites/socialgroupsscores(modifiedReintegrationtoNormalLivingIndex)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t3

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-continuousoutcomes-Participationinleisureactivites/socialgroupsscores(modifiedReintegrationtoNormalLivingIndex)-MeanSD-Music intervention delivered by non-healthcare professionals-No treatment-t6

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

Musicinterventiondeliveredbynon-healthcareprofessionalscomparedtonotreatmentat<6monthsand≥6months-dichotomousoutcome-Seriousadverseevents-NoOfEvents-Music intervention delivered by non-healthcare professionals-No treatment-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(Due to outcome indirectness (serious adverse events rather than withdrawal due to adverse events))*

Tian, 2020

Bibliographic Reference	Tian, R.; Zhang, B.; Zhu, Y.; Rhythmic Auditory Stimulation as an Adjuvant Therapy Improved Post-stroke Motor Functions of the Upper Extremity: A Randomized Controlled Pilot Study; Frontiers in Neuroscience; 2020; vol. 14; 649

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 Number1900026665

Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	Inpatient
Study dates	No additional information.
Sources of funding	Supported by the Project fund of Shanghai Science and technology commission. The project number was 18411962300
Inclusion criteria	Confirmed diagnosis of stroke with evidence on MRI or CT; having motor impairments in the upper extremity with a Brunnstrom Stages IV-VI; first-time stroke with or without previous lacunar infarction which resulted in no functional consequences; 40-80 years old; vital signs stable; inpatient rehabilitation status
Exclusion criteria	Having Parkinson's Disease or other neurological conditions causing motor dysfunction; having cognitive (MMSE <24) or auditory (tuning-fork test) impairment; having cancer or severe cardiopulmonary diseases; participating in other research projects; unable to follow commands; having pacemaker placement.
Recruitment / selection of participants	No additional information.
Intervention(s)	Music intervention delivered by healthcare professionals N=16 Rhythmic auditory stimulation 30 minutes every day, 5 days per week for 4 weeks. Paced activities based the applicable tempo that was gradually increased during the study. No more than a 5% increase was allowed in a day. Concomitant therapy: Everyone received 30 minutes individualised physical therapy and 30 minutes individualised occupational therapy per day, 5 days per week for 4 weeks.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information.
Comparator	No treatment N=16 An additional 15 minutes regular physical therapy and 15 minutes of regular occupational therapy per day. Concomitant therapy: Everyone received 30 minutes individualised physical therapy and 30 minutes individualised occupational therapy per day, 5 days per week for 4 weeks.
Number of participants	32
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Additional comments	No additional information

Study arms

Music intervention delivered by healthcare professionals (N = 16)

Rhythmic auditory stimulation 30 minutes every day, 5 days per week for 4 weeks. Paced activities based the applicable tempo that was gradually increased during the study. No more than a 5% increase was allowed in a day. Concomitant therapy: Everyone received 30 minutes individualised physical therapy and 30 minutes individualised occupational therapy per day, 5 days per week for 4 weeks.

No treatment (N = 16)

An additional 15 minutes regular physical therapy and 15 minutes of regular occupational therapy per day. Concomitant therapy: Everyone received 30 minutes individualised physical therapy and 30 minutes individualised occupational therapy per day, 5 days per week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (N = 16)	No treatment (N = 16)
% Female Sample size	n = 2 ; % = 13.3	n = 5 ; % = 33.3
Mean age (SD) (years) Mean (SD)	66.67 (13.59)	64.4 (13.41)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Music intervention delivered by healthcare professionals (N = 16)	No treatment (N = 16)
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) Mean (SD)	5 (7.55)	3.77 (9)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Frontal temporal lobe Sample size	n = 1 ; % = 7	n = 0 ; % = 0
Frontal lobe Sample size	n = 0 ; % = 0	n = 1 ; % = 7
Corona radiate Sample size	n = 1 ; % = 7	n = 0 ; % = 0
Capsule externa Sample size	n = 1 ; % = 7	n = 0 ; % = 0
Thalamus Sample size	n = 2 ; % = 13	n = 1 ; % = 7

Characteristic	Music intervention delivered by healthcare professionals (N = 16)	No treatment (N = 16)
Basal gangila Sample size	n = 9 ; % = 59	n = 8 ; % = 52
Brainstem Sample size	n = 1 ; % = 7	n = 3 ; % = 20
Paraventricular Sample size	n = 0 ; % = 0	n = 1 ; % = 7
Cerebellum Sample size	n = 0 ; % = 0	n = 1 ; % = 7

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention. <6 months.)

Music intervention delivered by healthcare professional compared to no treatment at <6 months - continuous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 16	Music intervention delivered by healthcare professionals, 4 week, N = 15	No treatment, Baseline, N = 16	No treatment, 4 week, N = 15
Activities of daily living (barthel index)	60.67 (10.33)	80.33 (8.96)	60.33 (6.4)	69.67 (7.19)

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 16	Music intervention delivered by healthcare professionals, 4 week, N = 15	No treatment, Baseline, N = 16	No treatment, 4 week, N = 15
Scale range: 0-100. Final values. Mean (SD)				

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

Music intervention delivered by healthcare professional compared to no treatment at <6 months - dichotomous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 16	Music intervention delivered by healthcare professionals, 4 week, N = 16	No treatment, Baseline, N = 16	No treatment, 4 week, N = 16
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtonotreatmentat<6months-continuousoutcome-Activitiesofdailyliving(barthelindex)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Musicinterventiondeliveredbyhealthcareprofessionalcomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by healthcare professionals-No treatment-t4

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

van Delden, 2009

Bibliographic Reference	van Delden, A. L.; Peper, C. L.; Harlaar, J.; Daffertshofer, A.; Zijp, N. I.; Nienhuys, K.; Koppe, P.; Kwakkel, G.; Beek, P. J.; Comparing unilateral and bilateral upper limb training: the ULTRA-stroke program design; BMC Neurology; 2009; vol. 9; 57

Study details

Secondary publication of another included study- see primary study for details	van Delden, A. L.; Peper, C. L.; Nienhuys, K. N.; Zijp, N. I.; Beek, P. J.; Kwakkel, G.; Unilateral versus bilateral upper limb training after stroke: the Upper Limb Training After Stroke clinical trial; Stroke; 2013; vol. 44 (no. 9); 2613-6
Other publications associated with	No additional information

this study included in review	

van Delden, 2013

Bibliographic Reference	van Delden, A. L.; Peper, C. L.; Nienhuys, K. N.; Zijp, N. I.; Beek, P. J.; Kwakkel, G.; Unilateral versus bilateral upper limb training after stroke: the Upper Limb Training After Stroke clinical trial; Stroke; 2013; vol. 44 (no. 9); 2613-6

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	van Delden, A. L.; Peper, C. L.; Harlaar, J.; Daffertshofer, A.; Zijp, N. I.; Nienhuys, K.; Koppe, P.; Kwakkel, G.; Beek, P. J.; Comparing unilateral and bilateral upper limb training: the ULTRA-stroke program design; BMC Neurology; 2009; vol. 9; 57
Trial name / registration number	ULTRA-Stroke
Study type	Randomised controlled trial (RCT)
Study location	The Netherlands
Study setting	A rehabilitation centre (outpatient follow up)
Study dates	No additional information.

Sources of funding	This study was funded by the Dutch Scientific College of Physiotherapy of the Royal Dutch Society for Physical Therapy.
Inclusion criteria	A first-ever ischemic or hemorrhagic stroke in one of the hemispheres, as verified by CT and/or MRI scan; an upper limb deficit, however with minimal control of the paretic wrist and fingers (i.e., able to execute at least 10° of active wrist extension, at least 10° of thumb abduction/extension, and at least 10° extension in at least 2 additional digits); a score on the Action Research Arm Test (ARAT) of less than 53 points; between 18 and 80 years of age; written or oral informed consent; sufficient motivation to participate.
Exclusion criteria	Upper extremity orthopaedic limitations; not being able to communicate (i.e., < 4 points on the Utrecht Communication Observation, UCO [63]); a Mini Mental State Examination (MMSE) score of < 24 points
Recruitment / selection of participants	People admitted to the Rehabilitation Centre Amsterdam.
Intervention(s)	Music intervention delivered by a healthcare professional N=19 Modified bilateral arm training rhythmic auditory cueing group applied by physiotherapists and/or occupational therapists working at the rehabilitation centre. Treatment was given as 60 minute sessions, 3 days a week for 6 weeks. This included 3 minute movement periods interspersed with 5-minute rest periods (effectively 21 minutes of active movement). During rest periods and before the first exercise, people received visual and oral feedback on the previous exercise and instructions for the following exercise. The movements were paced by an auditory metronome. The tempo of the auditory cues depended on the severity of the upper limb deficit and was selected individually. The training was increased over the course of the training. Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information
Comparator	No treatment N=19 Dose matched control treatment using an exercise therapy based on existing guidelines for upper extremity treatment after stroke as presented by the Dutch Society of Occupational Therapy and Royal Dutch Society of Physical Therapy. Exercise was the same as in the music intervention group but without the rhythmic cues. This was provided for 60 minute sessions, 3 days a week for 6 weeks. Concomitant therapy: No additional information. A third group was reported (N=22). This group received constraint induced movement therapy which was deemed to be greater than no treatment and so was not included in the analysis.
Number of participants	60

Duration of follow-up	6 weeks (end of intervention) and 12 weeks
Indirectness	No additional information
Additional comments	No additional information

Study arms

Music intervention delivered by a healthcare professional (N = 19)
Modified bilateral arm training rhythmic auditory cueing group applied by physiotherapists and/or occupational therapists working at the rehabilitation centre. Treatment was given as 60 minute sessions, 3 days a week for 6 weeks. This included 3 minute movement periods interspersed with 5-minute rest periods (effectively 21 minutes of active movement). During rest periods and before the first exercise, people received visual and oral feedback on the previous exercise and instructions for the following exercise. The movements were paced by an auditory metronome. The tempo of the auditory cues depended on the severity of the upper limb deficit and was selected individually. The training was increased over the course of the training. Concomitant therapy: No additional information.

No treatment (N = 19)
Dose matched control treatment using an exercise therapy based on existing guidelines for upper extremity treatment after stroke as presented by the Dutch Society of Occupational Therapy and Royal Dutch Society of Physical Therapy. Exercise was the same as in the music intervention group but without the rhythmic cues. This was provided for 60 minute sessions, 3 days a week for 6 weeks. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by a healthcare professional (N = 19)	No treatment (N = 19)
% Female Sample size	n = 8 ; % = 42.1	n = 3 ; % = 15.8
Mean age (SD) Mean (SD)	62.6 (9.8)	56.9 (12.7)
Ethnicity Nominal	NR	NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Weeks) Mean (SD)	7.8 (4.9)	11.1 (6.8)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - continuous outcome

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 19	Music intervention delivered by a healthcare professional, 12 week, N = 17	No treatment, Baseline, N = 19	No treatment, 12 week, N = 15
Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) Scale range: 0-100. Change scores. Mean (SD)	NR (NR)	NR (NR)	NR (NR)	NR (NR)
Strength Mean (SD)	49.7 (15.4)	-1.1 (13.1)	52.5 (14.2)	11.7 (13.1)
Memory Mean (SD)	85.9 (16.1)	0.2 (9.6)	83.8 (16.4)	-0.9 (8.2)
Emotion Mean (SD)	78.1 (16)	5.8 (18.1)	83 (14.3)	3.9 (11.7)
Communication Mean (SD)	90.2 (13.6)	2.3 (11.9)	87.2 (14.2)	3.1 (12.8)

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 19	Music intervention delivered by a healthcare professional, 12 week, N = 17	No treatment, Baseline, N = 19	No treatment, 12 week, N = 15
Activities of daily living Mean (SD)	56.4 (19.1)	2.8 (13.5)	61.4 (17.1)	0 (12.7)
Mobility Mean (SD)	56 (28.9)	1.8 (7.3)	68.9 (22.1)	3.1 (10.4)
Hand function Mean (SD)	27.4 (27.2)	11.5 (22.8)	33.7 (26.6)	9.7 (22.6)
Social participation Mean (SD)	37.8 (22.6)	6.8 (19.3)	44.6 (17.5)	3.1 (20.5)

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

Music intervention delivered by healthcare professionals compared to no treatment at <6 months - dichotomous outcome

Outcome	Music intervention delivered by a healthcare professional, Baseline, N = 19	Music intervention delivered by a healthcare professional, 12 week, N = 19	No treatment, Baseline, N = 19	No treatment, 12 week, N = 19
Withdrawal due to adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Strength-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Memory-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Emotion-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Communication-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Activitiesofdailyliving-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Mobility-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Handfunction-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-Socialparticipation-MeanSD-Music intervention delivered by a healthcare professional-No treatment-t12

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

Musicinterventiondeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by a healthcare professional-No treatment-t12

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

Whitall, 2011

Bibliographic Reference	Whitall, J.; Waller, S. M.; Sorkin, J. D.; Forrester, L. W.; Macko, R. F.; Hanley, D. F.; Goldberg, A. P.; Luft, A.; Bilateral and unilateral arm training improve motor function through differing neuroplastic mechanisms: a single-blinded randomized controlled trial; Neurorehabilitation & Neural Repair; 2011; vol. 25 (no. 2); 118-29

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 States of America
Study setting	Outpatient follow up
Study dates	No additional information.
Sources of funding	P60AG12583; PI AG, NIDDR H H133G010111, the Baltimore Veterans Administration Geriatrics Research, Education and Clinical Center (GRECC). Andreas Luft was supported by DFG SFB 550, C 12.
Inclusion criteria	People with unilateral stroke >6 months earlier; could follow simple instructions; had volitional control of the nonparetic arm; the ability to flex the paretic arm shoulder 3 inches from a neutral position.

Exclusion criteria	Symptomatic heart disease; uncontrolled hypertension (>180/100 mm Hg); significant orthopaedic or chronic pain conditions; untreated poststroke depression (Center for Epidemiological Studies Depression Scale; cutoff >16); active cancer; severe obstructive pulmonary disease; cognitive loss measured using the Folstein Mini Mental State Exam.
Recruitment / selection of participants	People were recruited from the Baltimore Veterans Affairs Medical Centre and involved referrals from the University of Maryland Medical System Hospital and regionwide advertisements.
Intervention(s)	Music intervention delivered by healthcare professionals N=55 Bilateral arm training with rhythmic auditory cueing for 3 times a week for 6 weeks (for a total of 18 sessions). Completed 5 minutes of training with arms moving simultaneously with auditory cuing, followed by 10 minutes at rest. Training continued for 5 minutes with arms moving alternately (antiphase) again with auditory cuing before 10 minutes of rest. This was then repeated once each achieving 20 minutes of active therapy in 1 hour sessions. Concomitant therapy: No additional information.
Subgroup 1: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared	Hospital sessions

to delivered in the community	
Subgroup 5: Type of intervention	Rhythmic auditory cueing
Population subgroups	No additional information.
Comparator	No treatment N=56 Dose matched therapeutic exercises for the same time period. Based on neurodevelopmental principles, including thoracic spine mobilisation with weight shifting, scapular mobilization, weight bearing with the paretic arm (elbow fixed) and opening the hand with finger extension. This was completed for 4 cycles of active continuous 5 minute training followed by 10 minutes of rest. Concomitant therapy: No additional information
Number of participants	111
Duration of follow-up	6 weeks (end of intervention) and 4 months. The 4 months data will be used where possible.
Indirectness	No additional information.
Additional comments	Intention-to-treat analysis including all participants at each time regardless of study completion

Study arms

Music intervention delivered by healthcare professionals (N = 55)

Bilateral arm training with rhythmic auditory cueing for 3 times a week for 6 weeks (for a total of 18 sessions). Completed 5 minutes of training with arms moving simultaneously with auditory cuing, followed by 10 minutes at rest. Training continued for 5 minutes with arms moving alternately (antiphase) again with auditory cuing before 10 minutes of rest. This was then repeated once each achieving 20 minutes of active therapy in 1 hour sessions. Concomitant therapy: No additional information.

No treatment (N = 56)

Dose matched therapeutic exercises for the same time period. Based on neurodevelopmental principles, including thoracic spine mobilisation with weight shifting, scapular mobilization, weight bearing with the paretic arm (elbow fixed) and opening the hand with finger extension. This was completed for 4 cycles of active continuous 5 minute training followed by 10 minutes of rest. Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (N = 55)	No treatment (N = 56)
% Female Sample size	n = 16 ; % = 29	n = 26 ; % = 46
Mean age (SD) (years) Mean (SD)	59.8 (9.9)	57.7 (12.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years)	4.5 (4.1)	4.1 (5.2)

Characteristic	Music intervention delivered by healthcare professionals (N = 55)	No treatment (N = 56)
Mean (SD)		
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Brainstem Sample size	n = 3 ; % = 5.4	n = 3 ; % = 5.4
Cerebellar Sample size	n = 0 ; % = 0	n = 2 ; % = 3.6
Cortex Sample size	n = 19 ; % = 34.6	n = 20 ; % = 35.7
Multiple Sample size	n = 3 ; % = 5.5	n = 0 ; % = 0
Subcortical Sample size	n = 7 ; % = 16.7	n = 12 ; % = 24

Outcomes

Study timepoints

- Baseline

- 6 week (End of intervention. <6 months (4 month follow up data not reported).)
- 4 month (For withdrawal due to adverse events only. <6 months.)

Music interventions delivered by healthcare professionals compared to no treatment at <6 months - continuous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 55	Music intervention delivered by healthcare professionals, 6 week, N = 37	Music intervention delivered by healthcare professionals, 4 month, N = 37	No treatment, Baseline, N = 56	No treatment, 6 week, N = 42	No treatment, 4 month, N = 42
Stroke-specific Patient Reported Outcome Measures (Stroke Impact Scale) Scale range: Unclear. Change scores. Mean (SD)	549 (17)	12 (6.1)	NR (NR)	578 (15)	26 (8.9)	NR (NR)

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

Music interventions delivered by healthcare professionals compared to no treatment at <6 months - dichotomous outcome

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 55	Music intervention delivered by healthcare professionals, 6 week, N = 55	Music intervention delivered by healthcare professionals, 4 month, N = 55	No treatment, Baseline, N = 56	No treatment, 6 week, N = 56	No treatment, 4 month, N = 56
Withdrawal due to adverse events Intervention: Medical = 10, death	n = NA ; % = NA	n = NA ; % = NA	n = 11	n = NA ; % = NA	n = NA ; % = NA	n = 11 ; % = 19.6

Outcome	Music intervention delivered by healthcare professionals, Baseline, N = 55	Music intervention delivered by healthcare professionals, 6 week, N = 55	Music intervention delivered by healthcare professionals, 4 month, N = 55	No treatment, Baseline, N = 56	No treatment, 6 week, N = 56	No treatment, 4 month, N = 56
= 1. Control: Medical = 11. No of events						

Withdrawal due to adverse events - Polarity - Lower values are better

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

Musicinterventionsdeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-continuousoutcome-Stroke-specificPatientReportedOutcomeMeasures(StrokeImpactScale)-MeanSD-Music intervention delivered by healthcare professionals-No treatment-t6

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

Musicinterventionsdeliveredbyhealthcareprofessionalscomparedtonotreatmentat<6months-dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Music intervention delivered by healthcare professionals-No treatment-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Zhang, 2021

Bibliographic Reference	Zhang, Xiao-Ying; Yu, Wei-Yong; Teng, Wen-Jia; Lu, Meng-Yang; Wu, Xiao-Li; Yang, Yu-Qi; Chen, Chen; Liu, Li-Xu; Liu, Song-Huai; Li, Jian-Jun; Effectiveness of Melodic Intonation Therapy in Chinese Mandarin on Non-fluent Aphasia in Patients After Stroke: A Randomized Control Trial.; Frontiers in neuroscience; 2021; vol. 15; 648724

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 (Registration No. ChiCTR2000037871)
Study type	Randomised controlled trial (RCT)
Study location	Beijing, China.
Study setting	China Rehabilitation Research Center (CRRC)
Study dates	April 2020 to October 2020

Sources of funding	This research was supported by the China Rehabilitation Research Center (CRRC). This research received a grant from the Scientific Research Project 2020CZ-10 of the Chinese Institute of Rehabilitation Science. It is a national non-profit foundation program and was approved by the Ministry of Finance of China.
Inclusion criteria	Diagnosed with fMRI or CT imaging, showing left ischemic stroke or hemorrhagic stroke; the ninth language score on the National Institutes of Health Stroke Scale (NIHSS) is 1— mild to moderate aphasia and 2—severe aphasia. Mets the diagnostic criteria for non-fluent aphasia: less active speech expression, lack of fluency in speaking, acceptable hearing ability, can give a sign of yes/no questions, willing to express, good cooperation, and emotional stability; Aphasia for more than 15 days after stroke, hospitalized patients; aged 18–70; tolerance to lying therapy for more than half an hour without postural hypotension. The medication and other brain metabolism enhancers are the same; physical therapy, occupational therapy, and routine care are the same. None of the participants had professional musical experience.
Exclusion criteria	Severe auditory dysfunction; having epilepsy, malignant arrhythmia, or other serious physical diseases; and patients with mental symptoms and obvious emotional agitation.
Recruitment / selection of participants	Recruited from China Rehabilitation Research Centre
Intervention(s)	Neurologic music therapy delivered by trained music therapists (melodic intonation therapy) N=20 All patients trained for 30 minutes per session, five sessions a week, for 8 weeks. The training process is carried out by music therapy professionals who have been trained in neurological musical therapy and have obtained a registered music therapist license to ensure the music professionalism of the intervention. The intervention steps of MIT strictly follow the operational steps of Chinese Mandarin MIT. According to the different three levels of speech rehabilitation, the music therapist trained the aphasia patients to intone and chant the targeted speech items and then fade slowly with tapping to let the patients speak out the targeted sentences in the first level. The music therapist leads the patients to sing and speak out in the same way in the second and third levels; the only difference is the length of the melodic target language (the second level is 5– 9-word sentences, and the third level is 10-word sentences and above). All the melodic phrases are noted according to the natural phonic pitches of targeted Mandarin sentences. The music therapist uses a keyboard or guitar to accompany while they are singing the melody with the patients. The effective behavioural performance of the intervention is that, when the therapist asks the target question, the patient can speak the target language at a natural speed without the melody and rhythm, and the behaviour performance can last for more than 3 weeks without regression. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.

Subgroup 1: Time after stroke at the start of the trial	Not stated/unclear
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Mixed
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Singing and music-based voice interventions
Population subgroups	No additional information.
Comparator	No treatment (Control group - speech therapy) N=20 Treated by speech therapy that was conducted by speech therapist. The sessions were 30 min per day, five times a week, for a total of eight consecutive weeks. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.
Number of participants	40
Duration of follow-up	8 weeks.
Indirectness	No indirectness.

Additional comments	No additional information.

Study arms

Neurologic music therapy delivered by trained music therapists (melodic intonation therapy) (N = 20)

Intervention(s)	Melodic intonation therapy (MIT) delivered by music therapy professionals N=20 All patients trained for 30 minutes per session, five sessions a week, for 8 weeks. The training process is carried out by music therapy professionals who have been trained in neurological musical therapy and have obtained a registered music therapist license to ensure the music professionalism of the intervention. The intervention steps of MIT strictly follow the operational steps of Chinese Mandarin MIT. According to the different three levels of speech rehabilitation, the music therapist trained the aphasia patients to intone and chant the targeted speech items and then fade slowly with tapping to let the patients speak out the targeted sentences in the first level. The music therapist leads the patients to sing and speak out in the same way in the second and third levels; the only difference is the length of the melodic target language (the second level is 5– 9-word sentences, and the third level is 10-word sentences and above). All the melodic phrases are noted according to the natural phonic pitches of targeted Mandarin sentences. The music therapist uses a keyboard or guitar to accompany while they are singing the melody with the patients. The effective behavioural performance of the intervention is that, when the therapist asks the target question, the patient can speak the target language at a natural speed without the melody and rhythm, and the behaviour performance can last for more than 3 weeks without regression. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.
Comparator	Control group - speech therapy from therapist.

All patients trained for 30 minutes per session, five sessions a week, for 8 weeks. The training process is carried out by music therapy professionals who have been trained in neurological musical therapy and have obtained a registered music therapist license to ensure the music professionalism of the intervention. The intervention steps of MIT strictly follow the operational steps of Chinese Mandarin MIT. According to the different three levels of speech rehabilitation, the music therapist trained the aphasia patients to intone and chant the targeted speech items and then fade slowly with tapping to let the patients speak out the targeted sentences in the first level. The music therapist leads the patients to sing and speak out in the same way in the second and third levels; the only difference is the length of the melodic target language (the second level is 5– 9-word sentences, and the third level is 10-word sentences and above). All the melodic phrases are noted according to the natural phonic pitches of targeted Mandarin sentences. The music therapist uses a keyboard or guitar to accompany while they are singing the melody with the patients. The effective behavioural performance of the

intervention is that, when the therapist asks the target question, the patient can speak the target language at a natural speed without the melody and rhythm, and the behaviour performance can last for more than 3 weeks without regression. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.

No treatment (Control group - speech therapy) (N = 20)

Intervention(s)	Melodic intonation therapy (MIT) delivered by music therapy professionals N=20 All patients trained for 30 minutes per session, five sessions a week, for 8 weeks. The training process is carried out by music therapy professionals who have been trained in neurological musical therapy and have obtained a registered music therapist license to ensure the music professionalism of the intervention. The intervention steps of MIT strictly follow the operational steps of Chinese Mandarin MIT. According to the different three levels of speech rehabilitation, the music therapist trained the aphasia patients to intone and chant the targeted speech items and then fade slowly with tapping to let the patients speak out the targeted sentences in the first level. The music therapist leads the patients to sing and speak out in the same way in the second and third levels; the only difference is the length of the melodic target language (the second level is 5– 9-word sentences, and the third level is 10-word sentences and above). All the melodic phrases are noted according to the natural phonic pitches of targeted Mandarin sentences. The music therapist uses a keyboard or guitar to accompany while they are singing the melody with the patients. The effective behavioural performance of the intervention is that, when the therapist asks the target question, the patient can speak the target language at a natural speed without the melody and rhythm, and the behaviour performance can last for more than 3 weeks without regression. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.
Comparator	Control group - speech therapy from therapist.

Treated by speech therapy that was conducted by speech therapist. The sessions were 30 min per day, five times a week, for a total of eight consecutive weeks. Concomitant therapy: All patients underwent routine treatment during the study period, including taking medication and other care and support.

1 **Characteristics**

2 ***Arm-level characteristics***

Characteristic	Neurologic music therapy delivered by trained music therapists (melodic intonation therapy) (N = 20)	No treatment (Control group - speech therapy) (N = 20)
% Female (Sample size) Sample size	n = 4 ; % = 20	n = 5 ; % = 25
Mean age (SD) Mean (SD)	52.9 (9.08)	54.05 (10.81)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Standardised Mean (SD)	2.57 (1.74)	1.96 (1.38)
Severity Nominal	NR	NR
Left cortical ischaemic Nominal	10	14

Characteristic	Neurologic music therapy delivered by trained music therapists (melodic intonation therapy) (N = 20)	No treatment (Control group - speech therapy) (N = 20)
Left cortical hemorrhagic Nominal	10	6

Outcomes

Study timepoints

- Baseline
- 8 week (< 6 months)

Melodic intonation therapy delivered by music therapy professionals compared to speech therapy at < 6 months - continuous

Outcome	Baseline, Neurologic music therapy delivered by trained music therapists (melodic intonation therapy), N = 20	Baseline, No treatment (Control group - speech therapy), N = 20	8 week, Neurologic music therapy delivered by trained music therapists (melodic intonation therapy), N = 20	8 week, No treatment (Control group - speech therapy), N = 20
Psychological distress - anxiety (Hamilton Anxiety Rating Scale) Scale range: 0-56. Final values. Mean (SD)	12.15 (3.16)	12.75 (2.47)	8.6 (2.68)	9.65 (1.8)
Psychological distress - depression (Hamilton Depression Scale) (17 item score battery using a five-level scoring method of 0-4 points. Score ranges from	16.15 (2.52)	16.45 (2.25)	8.95 (1.97)	10.9 (1.64)

Outcome	Baseline, Neurologic music therapy delivered by trained music therapists (melodic intonation therapy), N = 20	Baseline, No treatment (Control group - speech therapy), N = 20	8 week, Neurologic music therapy delivered by trained music therapists (melodic intonation therapy), N = 20	8 week, No treatment (Control group - speech therapy), N = 20
asymptomatic to extremely severe) Scale range: 0-56. Final values. Mean (SD)				

Psychological distress - anxiety (Hamilton Anxiety Rating Scale) - Polarity - Lower values are better
Psychological distress - depression (Hamilton Depression Scale) - Polarity - Lower values are better

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

Melodicintonationtherapydeliveredbymusictherapyprofessionalscomparedtospeechtherapyat<6months-continuous-Psychologicaldistress-MeanSD-Melodic intonation therapy (MIT) delivered by music therapy professionals-Control group - speech therapy-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(Allocation concealment not mentioned)*
Overall bias and Directness	Overall Directness	Directly applicable

Melodicintonationtherapydeliveredbymusictherapyprofessionalscomparedtospeechtherapyat<6months-continuous-HamiltonDepressionScale-MeanSD-Melodic intonation therapy (MIT) delivered by music therapy professionals-Control group - speech therapy-t8

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(Allocation concealment not mentioned)*
Overall bias and Directness	Overall Directness	Directly applicable

Zhao, 2022

Bibliographic Reference	Zhao, Li; Lyu, Xiaokang; Jiang, He; Gao, Xinhai; Musicokinetic and exercise therapies decrease the depression level of elderly patients undergoing post-stroke rehabilitation: The moderating effect of health regulatory focus.; Frontiers in psychology; 2022; vol. 13; 889510

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	Shanghai, China
Study setting	Hospital in Shanghai, China.
Study dates	December 2019 to March 2020.
Sources of funding	This work was supported partially by the Tianjin Social Science Foundation of China (TJJX21-011) and the Developmental Program of Liberal and Social Sciences of Nankai University (ZB22BZ0109).
Inclusion criteria	Patients who (1) were at least 60 years old; (2) met the diagnostic criteria in the 2018 edition of the Chinese Guidelines for the Management of Acute Ischemic Stroke or the 2019 edition of the Chinese Guidelines for the Management of Cerebral Hemorrhage; (3) had approximately two weeks after the stroke; (4) with neurological sequelae requiring rehabilitative exercise therapy; (5) received at least eight points on the Chinese version of Hamilton Depression Rating Scale with 24 items (HDRS-24); and (6) received at least 27 points on the Mini-mental State Examination (MMSE).
Exclusion criteria	Patients (1) with other serious organ diseases, such as a malignant tumor, myocardial infarction, and comatose; (2) who were unable to take exercise therapy after the stroke attack; (3) or their relatives who refuse to take the exercise or musicokinetic therapy; (4) who received antidepressant medication in the past month; and (5) who withdrew from treatments due to transfer and personal reasons.
Recruitment / selection of participants	A convenience sampling method was used, and data were collected from elderly patients undergoing post-stroke rehabilitation treatments in one hospital located in Shanghai, China.
Intervention(s)	Musicokinetic therapy group: Exercise treatment and music component of background music in the rehabilitation room. The Edifier S2000MKIII speaker in the rehabilitation room was used as the music-playing equipment. Participants listened to the same type of ambient pure music from Bandari. Bandari produces music with slower and softer rhythm and many people in China choose to listen to Bandar music to relax. The volume of the music was set to 50 decibels. The musicokinetic therapy lasted for 30 minutes each time and was performed twice a day. The whole musicokinetic therapy lasted 8 weeks. Exercise treatment: participants focused on active exercises, including isometric muscle, joint function, speech and swallowing function, balance function, and gait training. The length of each exercise was 30 minutes and performed twice a day. The rehabilitation room in this study was about 80 m2 and exercise therapy lasted 8 weeks.

	Concomitant treatment: All participants ingested one tablet of Sertraline Hydrochloride (50mg) which is a type of antidepressant drug, every morning during the experimental period.
Subgroup 1: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 2: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 3: Group compared to individual sessions of music therapy	Individual sessions
Subgroup 4: Delivered in hospital compared to delivered in the community	Hospital sessions
Subgroup 5: Type of intervention	Receptive interventions in which participants listen to music
Population subgroups	No additional information.
Comparator	Exercise therapy group: participants focused on active exercises, including isometric muscle, joint function, speech and swallowing function, balance function, and gait training. The length of each exercise was 30 minutes and performed twice a day. The rehabilitation room in this study was about 80 m2 and exercise therapy lasted 8 weeks. Concomitant treatment: All participants ingested one tablet of Sertraline Hydrochloride (50mg) which is a type of antidepressant drug, every morning during the experimental period.

Number of participants	65
Duration of follow-up	8 weeks.
Indirectness	No indirectness.
Additional comments	No additional information.

Study arms

Music intervention delivered by healthcare professionals (Musicokinetic therapy group) (N = 32)
Exercise treatment and music component of background music in the rehabilitation room. The Edifier S2000MKIII speaker in the rehabilitation room was used as the music-playing equipment. Participants listened to the same type of ambient pure music from Bandari. Bandari produces music with slower and softer rhythm and many people in China choose to listen to Bandar music to relax. The volume of the music was set to 50 decibels. The musicokinetic therapy lasted for 30 minutes each time and was performed twice a day. The whole musicokinetic therapy lasted 8 weeks.

No treatment (Exercise therapy group) (N = 33)
Participants focused on active exercises, including isometric muscle, joint function, speech and swallowing function, balance function, and gait training. The length of each exercise was 30 minutes and performed twice a day. The rehabilitation room in this study was about 80 m2 and exercise therapy lasted 8 weeks.

Characteristics

Study-level characteristics

Characteristic	Study (N = 65)
% Female No of events	n = 37 ; % = 56.9
Mean age (SD) Mean (SD)	81.14 (8.33)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Time after stroke Nominal	NR
Severity Nominal	NR
Type of stroke Nominal	NR

Arm-level characteristics

Characteristic	Music intervention delivered by healthcare professionals (Musicokinetic therapy group) (N = 32)	No treatment (Exercise therapy group) (N = 33)
% Female No of events	n = NR ; % = NR	n = NR ; % = NR
Mean age (SD) Mean (SD)	NR (NR)	NR (NR)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Time after stroke Nominal	NR	NR
Severity Nominal	NR	NR
Type of stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Hamilton Depression Rating Scale-24

Outcome	Baseline, Music intervention delivered by healthcare professionals (Musicokinetic therapy group), N = 32	Baseline, No treatment (Exercise therapy group), N = 33	8 week, Music intervention delivered by healthcare professionals (Musicokinetic therapy group), N = 32	8 week, No treatment (Exercise therapy group), N = 33
Psychological distress - depression (Hamilton Depression Rating Scale-24) (In the Chinese version of HDRS-24, 14 items were scored on a 5-point Likert scale from 0 to 4, and 10 items were scored on a 3-point scale from 0 to 2, representing from absent to severe, respectively. If the final score was less than 8, the patient could be considered to be normal/non-depressed, and if the final score was 8 or higher, the patient could be considered to have varying degrees of depressive symptoms) Scale range: 0-42. Final values. Mean (SD)	23.97 (11.33)	32.3 (17.9)	16.38 (9.92)	29.7 (19.43)

Psychological distress - depression (Hamilton Depression Rating Scale-24) - Polarity - Lower values are better

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

HamiltonDepressionRatingScale-24-HamiltonDepressionRatingScale-24-MeanSD-Musicokinetic therapy group-Exercise therapy group-t8

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(No mention of allocation concealment, no mention of blinding and subjective outcome and baseline measures of outcome were different)*
Overall bias and Directness	Overall Directness	Directly applicable

Appendix E – Forest plots

E.1 Neurologic music therapy delivered by trained music therapists compared to no treatment

Figure 2: Person/participant generic health-related quality of life (SF-36 physical functioning, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	17.43	4.73	30	16	5.38	31	1.43 [-1.11, 3.97]

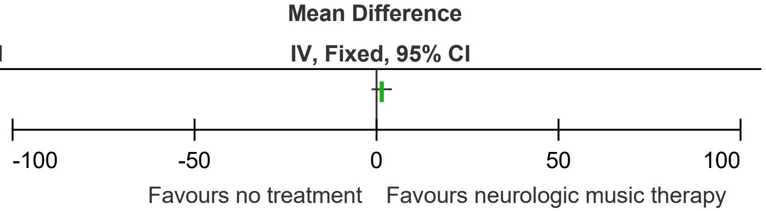


Figure 3: Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	8.63	2.31	30	8.16	2.67	31	0.47 [-0.78, 1.72]

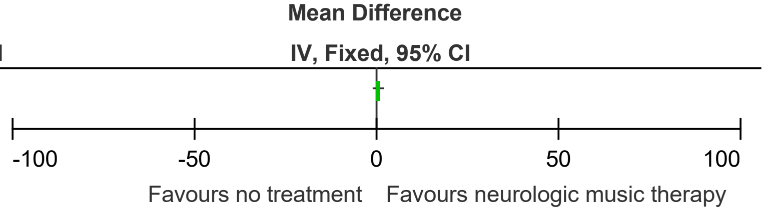


Figure 4: Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	5	1.05	30	4.71	0.94	31	0.29 [-0.21, 0.79]

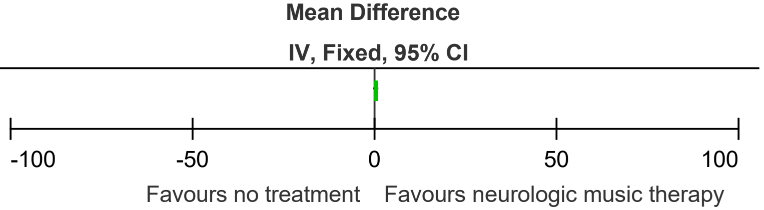


Figure 5: Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	18.63	3.19	30	14.52	3.84	31	4.11 [2.34, 5.88]

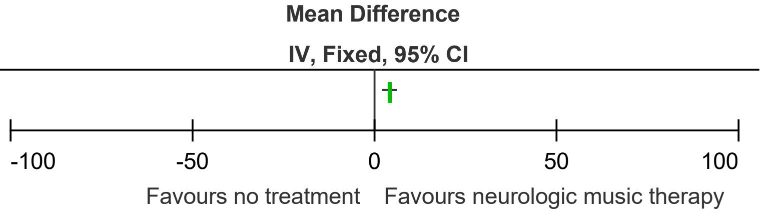


Figure 6: Person/participant generic health-related quality of life (SF-36 general health, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	17.43	3.1	30	15.97	3.7	31	1.46 [-0.25, 3.17]

Mean Difference
IV, Fixed, 95% CI

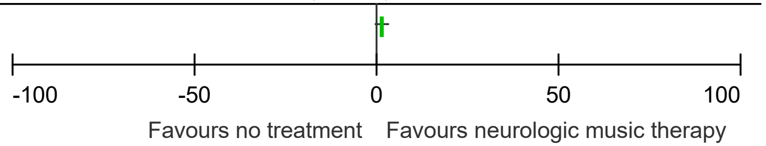


Figure 7: Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	5.83	0.53	30	5	1.29	31	0.83 [0.34, 1.32]

Mean Difference
IV, Fixed, 95% CI

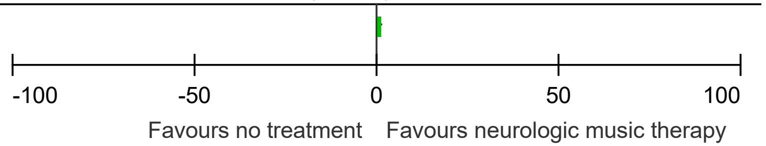


Figure 8: Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	24.23	3.67	30	20.48	5.81	31	3.75 [1.32, 6.18]

Mean Difference
IV, Fixed, 95% CI

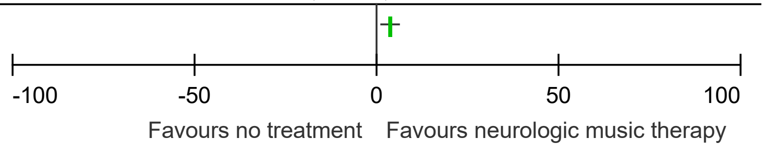


Figure 9: Person/participant generic health-related quality of life (SF-36 social functioning, 0-100, higher values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	7.37	1.87	30	6.81	2.47	31	0.56 [-0.54, 1.66]

Mean Difference
IV, Fixed, 95% CI

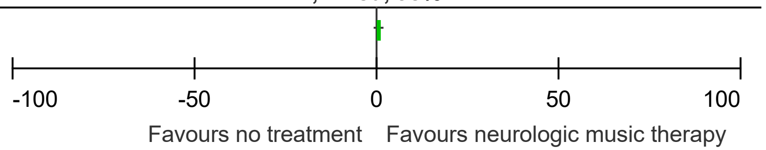


Figure 10: Psychological distress - depression (Hamilton Depression Scale, 0-56, lower values are better, final value) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Zhang 2021	8.95	1.97	20	10.9	1.64	20	-1.95 [-3.07, -0.83]

Mean Difference
IV, Fixed, 95% CI

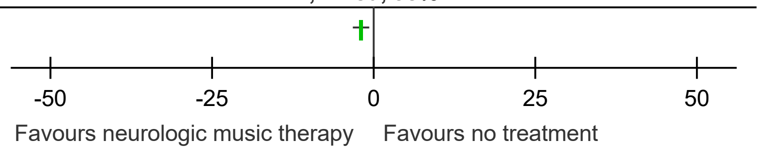


Figure 11: Psychological distress - anxiety (Hamilton Anxiety Rating Scale, 0-56, lower values are better, final value) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Zhang 2021	8.6	2.68	20	9.65	1.8	20	-1.05 [-2.46, 0.36]

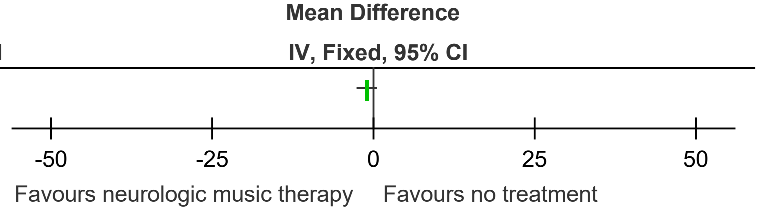
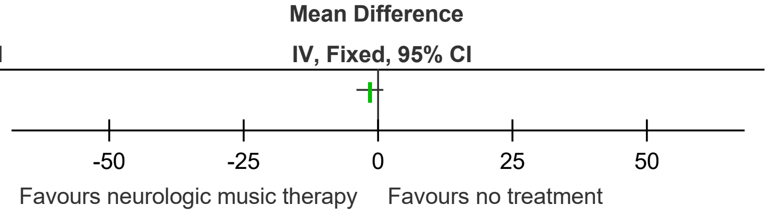


Figure 12: Stroke-specific Patient-Reported Outcome Measures (Stroke adjusted Sickness Impact Profile 30, 0-68, lower values are better, final values) at <6 months

	Neurologic music therapy			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pocwierz-Marciniak 2017	14.9	4.62	30	16.42	4.63	31	-1.52 [-3.84, 0.80]



E.2 Music therapy delivered by trained music therapists compared to no treatment

Figure 13: Patient/participant generic health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Raglio 2017	7.76	1.34	19	7.49	1.68	19	0.27 [-0.70, 1.24]

Mean Difference
IV, Fixed, 95% CI

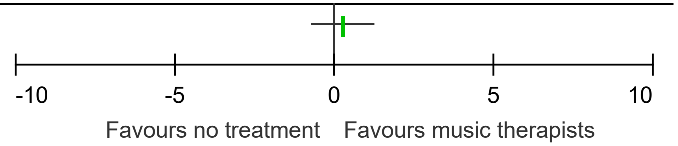


Figure 14: Activities of daily living (Korean-Modified Barthel Index, 0-100, higher values are better, change score) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Jun 2013	9.2	4.81	15	7.2	29.75	15	2.00 [-13.25, 17.25]

Mean Difference
IV, Fixed, 95% CI

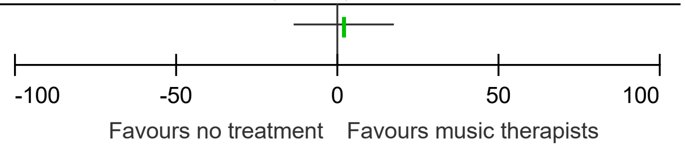


Figure 15: Activities of daily living (Functional independence measure, 18-126, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Raglio 2017	110.47	9.9	19	106.89	16.83	19	3.58 [-5.20, 12.36]

Mean Difference
IV, Fixed, 95% CI

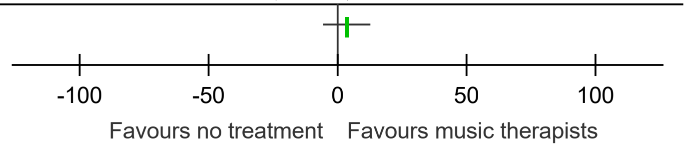


Figure 16: Psychological distress - Depression (HADS-D, BDI, Faces scale, PANAS - negative affect [different scale ranges], lower values are better, final values) at <6 months

	Music therapists			No treatment				Std. Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Fixed, 95% CI**
Fujioka 2018	18	6.82	14	17.29	8.56	14	23.1%	0.09 [-0.65, 0.83]
Kim 2011	12.4	4.6	9	11.1	2.5	9	14.6%	0.33 [-0.60, 1.27]
Nayak 2000	2.8	1.32	10	3.88	1.36	8	13.4%	-0.77 [-1.74, 0.20]
Palumbo 2022	3.15	3	13	3.44	5.7	9	17.5%	-0.07 [-0.92, 0.79]
Raglio 2017	4.47	3.57	19	4.33	3.11	19	31.4%	0.04 [-0.60, 0.68]
Total (95% CI)			**65**			**59**	**100.0%**	**-0.03 [-0.39, 0.32]**

Heterogeneity: Chi² = 2.96, df = 4 (P = 0.56); I² = 0%

Test for overall effect: Z = 0.18 (P = 0.86)

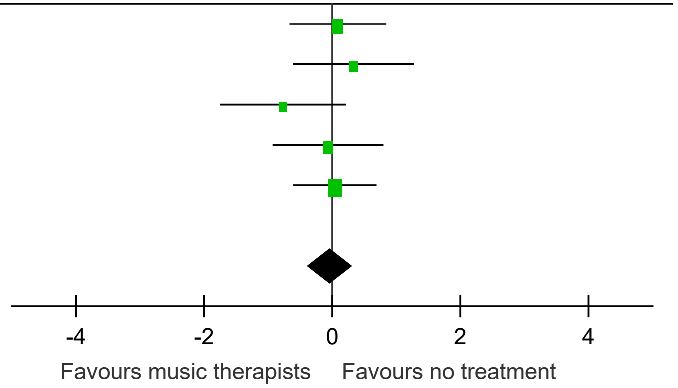


Figure 17: Psychological distress - Depression (Center for Epidemiologic Studies Depression Scale, 0-60, lower values are better, change score) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**IV, Fixed, 95% CI**
Jun 2013	-6.46	11.82	15	-9.67	15.27	15	3.21 [-6.56, 12.98]

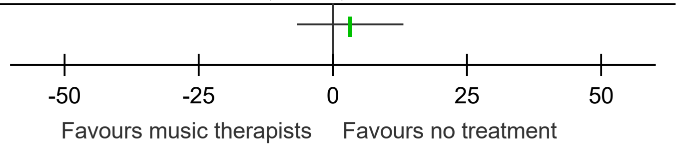


Figure 18: Psychological distress - Anxiety (HADS-A, BAI [different scale ranges], lower values are better, final values) at <6 months

	Music therapists			No treatment				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Kim 2011	9	4.3	9	9.2	2.6	9	32.3%	-0.05 [-0.98, 0.87]
Raglio 2017	4.83	3.5	19	5.73	3.97	19	67.7%	-0.24 [-0.87, 0.40]
Total (95% CI)			**28**			**28**	**100.0%**	**-0.18 [-0.70, 0.35]**

Heterogeneity: Chi² = 0.10, df = 1 (P = 0.75); I² = 0%

Test for overall effect: Z = 0.66 (P = 0.51)

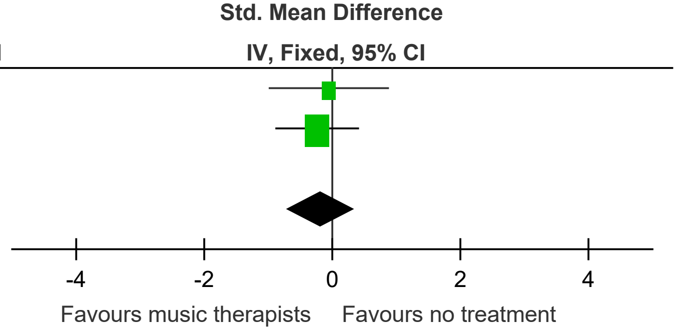


Figure 19: Psychological distress (PANAS - positive affect, 10-50, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Fujioka 2018	36.79	8.19	14	32.64	8.45	14	4.15 [-2.01, 10.31]

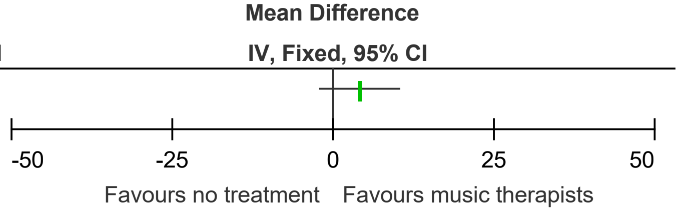


Figure 20: Stroke-specific Patient-Reported Outcome Measures (Stroke specific quality of life, 49-245, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Cha 2014	183.7	21.5	10	159.2	17.4	10	24.50 [7.36, 41.64]

Mean Difference IV, Fixed, 95% CI

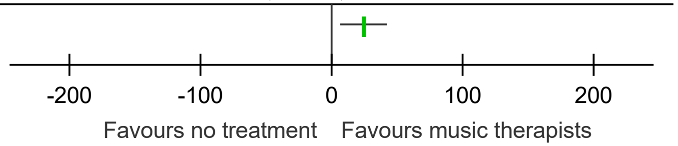


Figure 21: Stroke-specific Patient-Reported Outcome Measures (SIS physical strength, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Palumbo 2022	38.4	14	13	49.1	18.9	12	-10.70 [-23.83, 2.43]

Mean Difference IV, Fixed, 95% CI

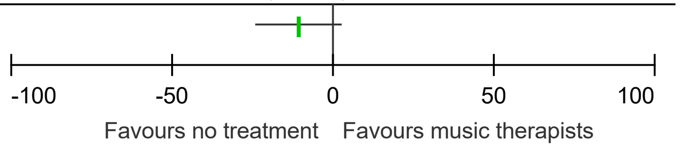


Figure 22: Stroke-specific Patient-Reported Outcome Measures (SIS activities, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Palumbo 2022	46.9	17.6	13	53.3	17.4	12	-6.40 [-20.13, 7.33]

Mean Difference IV, Fixed, 95% CI

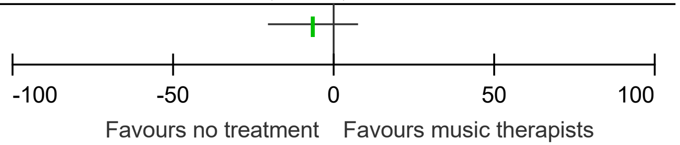


Figure 23: Stroke-specific Patient-Reported Outcome Measures (SIS hand use, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**IV, Fixed, 95% CI**
Palumbo 2022	19	25	13	31	30	12	-12.00 [-33.74, 9.74]

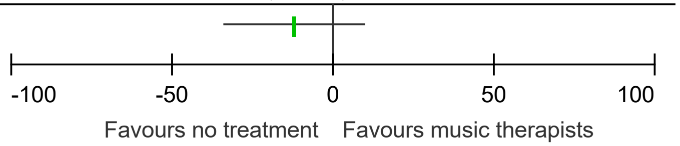


Figure 24: Stroke-specific Patient-Reported Outcome Measures (SIS mobility, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment				Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Fixed, 95% CI**
Fujioka 2018	60.86	9.68	14	63.13	16.61	14	69.6%	-2.27 [-12.34, 7.80]
Palumbo 2022	47.6	22.6	13	58.7	15.9	12	30.4%	-11.10 [-26.33, 4.13]
Total (95% CI)			**27**			**26**	**100.0%**	**-4.96 [-13.36, 3.44]**

Heterogeneity: Chi² = 0.90, df = 1 (P = 0.34); I² = 0%

Test for overall effect: Z = 1.16 (P = 0.25)

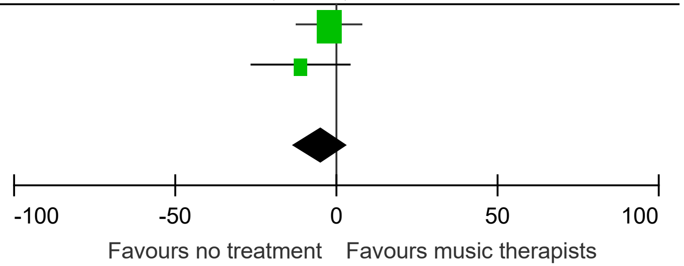


Figure 25: Stroke-specific Patient-Reported Outcome Measures (SIS communication, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Fujioka 2018	90.3	9.23	14	92.11	10.37	14	71.8%	-1.81 [-9.08, 5.46]
Palumbo 2022	71.4	15.5	13	73.5	14.1	12	28.2%	-2.10 [-13.70, 9.50]
Total (95% CI)			**27**			**26**	**100.0%**	**-1.89 [-8.05, 4.27]**

Heterogeneity: Chi² = 0.00, df = 1 (P = 0.97); I² = 0%
Test for overall effect: Z = 0.60 (P = 0.55)

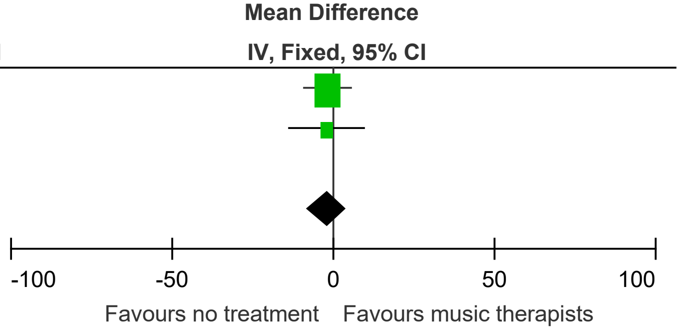


Figure 26: Stroke-specific Patient-Reported Outcome Measures (SIS memory, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Fujioka 2018	82.91	12.59	14	83.16	22.55	14	47.1%	-0.25 [-13.78, 13.28]
Palumbo 2022	70.1	15.1	13	71.1	17.3	12	52.9%	-1.00 [-13.77, 11.77]
Total (95% CI)			**27**			**26**	**100.0%**	**-0.65 [-9.93, 8.64]**

Heterogeneity: Chi² = 0.01, df = 1 (P = 0.94); I² = 0%
Test for overall effect: Z = 0.14 (P = 0.89)

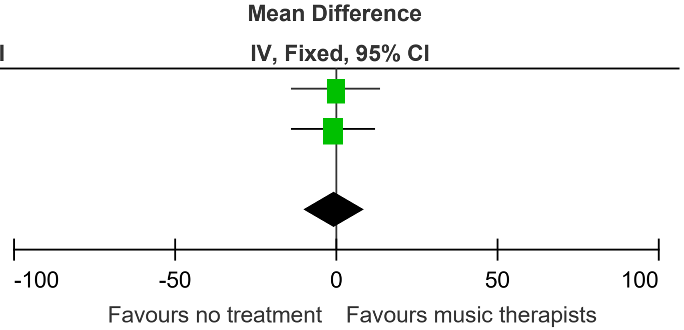


Figure 27: Stroke-specific Patient-Reported Outcome Measures (SIS emotion, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment				Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Fixed, 95% CI**
Fujioka 2018	76.8	18.22	14	77	20.68	14	36.4%	-0.20 [-14.64, 14.24]
Palumbo 2022	60.5	13.7	13	58.8	14.1	12	63.6%	1.70 [-9.21, 12.61]
Total (95% CI)			**27**			**26**	**100.0%**	**1.01 [-7.70, 9.72]**

Heterogeneity: Chi² = 0.04, df = 1 (P = 0.84); I² = 0%

Test for overall effect: Z = 0.23 (P = 0.82)

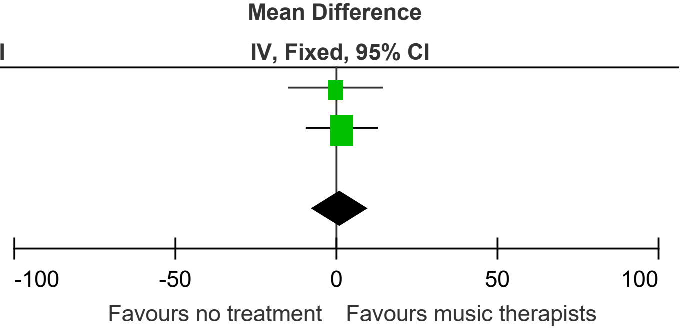


Figure 28: Stroke-specific Patient-Reported Outcome Measures (SIS social/participation, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment				Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Fixed, 95% CI**
Fujioka 2018	63.52	14.36	14	59.3	24.95	14	48.1%	4.22 [-10.86, 19.30]
Palumbo 2022	46.5	17.5	13	55	19.4	12	51.9%	-8.50 [-23.03, 6.03]
Total (95% CI)			**27**			**26**	**100.0%**	**-2.38 [-12.84, 8.08]**

Heterogeneity: Chi² = 1.42, df = 1 (P = 0.23); I² = 29%

Test for overall effect: Z = 0.45 (P = 0.66)

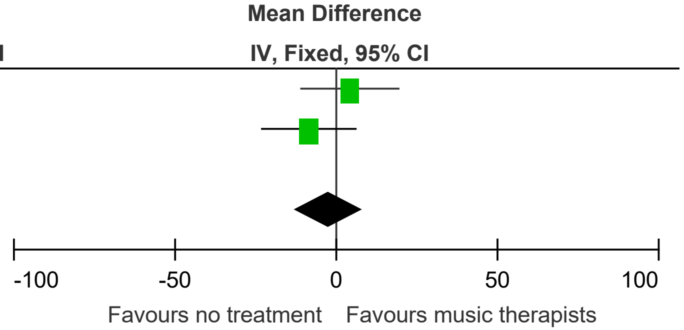


Figure 29: Stroke-specific Patient-Reported Outcome Measures (SIS recovery, 0-100, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Palumbo 2022	61.5	12.6	13	62.7	18.4	12	-1.20 [-13.66, 11.26]

Mean Difference
IV, Fixed, 95% CI

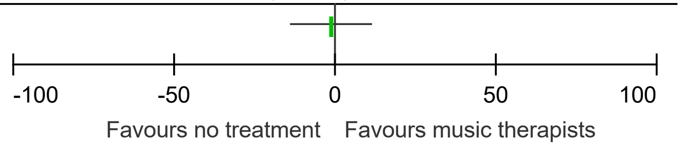


Figure 30: Wellbeing scores (WHO five item well-being index, 0-25, higher values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Palumbo 2022	21.4	4.31	13	19	5.96	12	2.40 [-1.71, 6.51]

Mean Difference
IV, Fixed, 95% CI

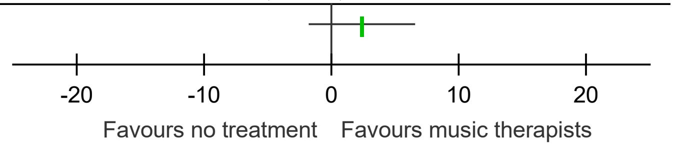


Figure 31: Participation in leisure activities/social groups (Sickness Impact Profile Social Interaction subscale, 0-102, lower values are better, final value) at <6 months

	Music therapists			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Nayak 2000	29.6	4.5	10	42.88	8.34	8	-13.28 [-19.70, -6.86]

Mean Difference
IV, Fixed, 95% CI

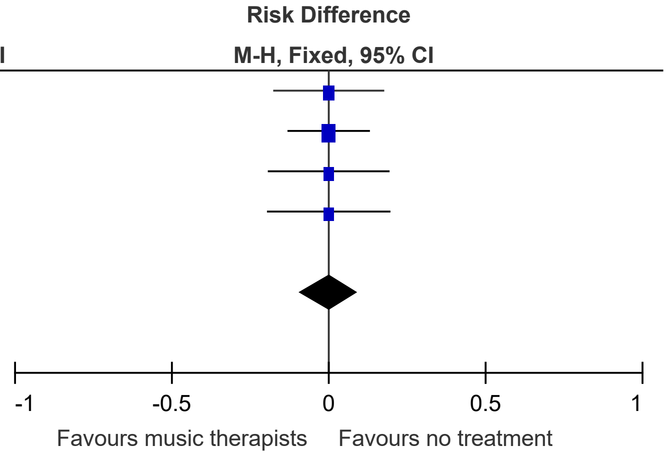
Note: *Baseline music therapists: 37.6 (7.55). Baseline no treatment: 44.5 (7.19).*

Figure 32: Withdrawal due to adverse events at <6 months

	Music therapists		No treatment			Risk Difference
Study or Subgroup	**Events**	**Total**	**Events**	**Total**	**Weight**	**M-H, Fixed, 95% CI**
Cha 2014	0	10	0	10	23.9%	0.00 [-0.17, 0.17]
Fujioka 2018	0	14	0	14	33.4%	0.00 [-0.13, 0.13]
Kim 2011	0	9	0	9	21.5%	0.00 [-0.19, 0.19]
Nayak 2000	0	10	0	8	21.2%	0.00 [-0.19, 0.19]
Total (95% CI)		**43**		**41**	**100.0%**	**0.00 [-0.09, 0.09]**
Total events	0		0			

Heterogeneity: Chi² = 0.00, df = 3 (P = 1.00); I² = 0%

Test for overall effect: Z = 0.00 (P = 1.00)



E.3 Music intervention delivered by healthcare professionals compared to passive music listening

Figure 33: Withdrawal due to adverse events at <6 months

	Healthcare professionals		Passive music listening		Risk Ratio
Study or Subgroup	Events	Total	Events	Total	M-H, Fixed, 95% CI
Baylan 2020	4	23	1	25	4.35 [0.52, 36.11]

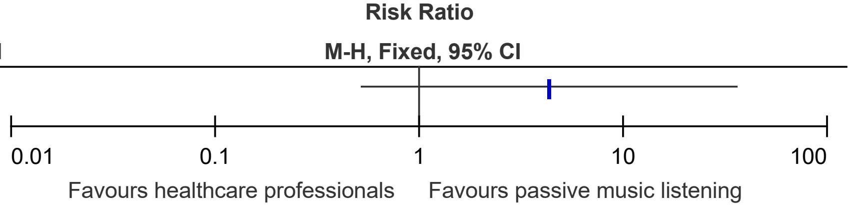
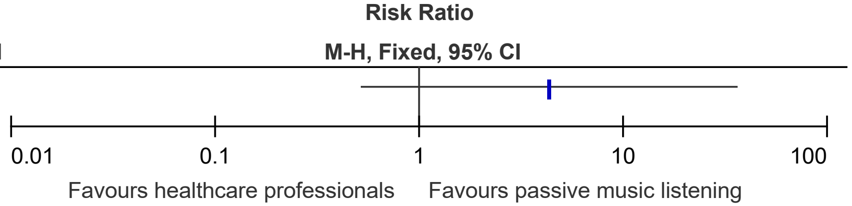


Figure 34: Withdrawal due to adverse events at ≥6 months

	Healthcare professionals		Passive music listening		Risk Ratio
Study or Subgroup	Events	Total	Events	Total	M-H, Fixed, 95% CI
Baylan 2020	4	23	1	25	4.35 [0.52, 36.11]



E.4 Music intervention delivered by healthcare professionals compared to placebo music therapy

Figure 35: Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean difference) at <6 months

Study or Subgroup	Mean Difference	SE	Healthcare professionals Total	Placebo Total	Mean Difference IV, Fixed, 95% CI
Baylan 2020	0.7	1.199	23	25	0.70 [-1.65, 3.05]

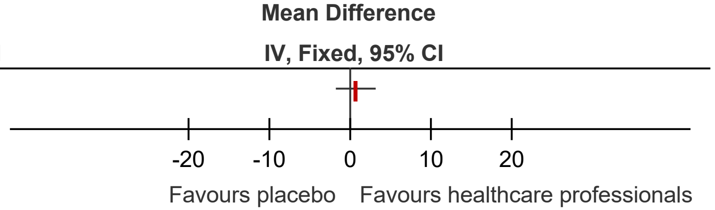


Figure 36: Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean difference) at ≥6 months

Study or Subgroup	Mean Difference	SE	Healthcare professionals Total	Placebo Total	Mean Difference IV, Fixed, 95% CI
Baylan 2020	1.02	1.2143	23	25	1.02 [-1.36, 3.40]

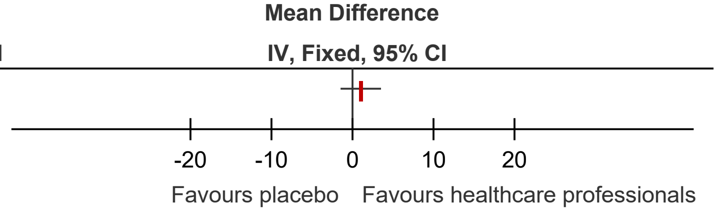


Figure 37: Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at <6 months

Study or Subgroup	Mean Difference	SE	Healthcare professionals Total	Placebo Total	Mean Difference IV, Fixed, 95% CI
Baylan 2020	0.69	1.1021	23	25	0.69 [-1.47, 2.85]

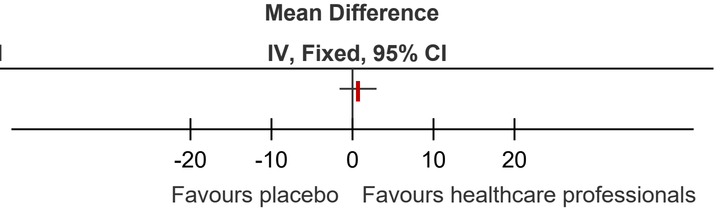


Figure 38: Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at ≥6 months

Study or Subgroup	Mean Difference	SE	Healthcare professionals Total	Placebo Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Baylan 2020	2	1.1633	23	25	2.00 [-0.28, 4.28]	

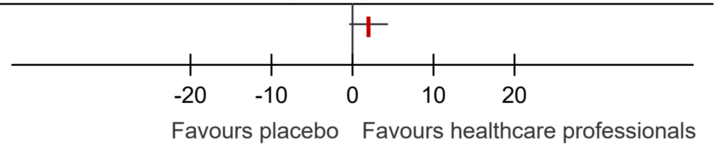


Figure 39: Participation in leisure activities/social group scores (Mayo-Portland Adaptability Inventory 4 participation, 0-30, higher values are better, mean difference) at <6 months

Study or Subgroup	Mean Difference	SE	Healthcare professionals Total	Placebo Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Baylan 2020	1.72	6.8726	23	25	1.72 [-11.75, 15.19]	

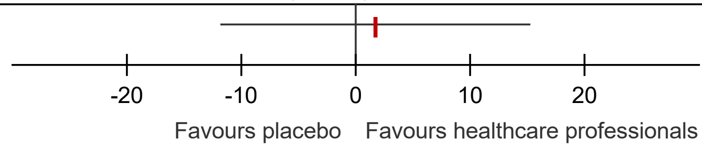


Figure 40: Withdrawal due to adverse events at <6 months

Study or Subgroup	Healthcare professionals Events	Healthcare professionals Total	Placebo Events	Placebo Total	Risk Ratio M-H, Fixed, 95% CI	Risk Ratio M-H, Fixed, 95% CI
Baylan 2020	4	23	1	25	4.35 [0.52, 36.11]	

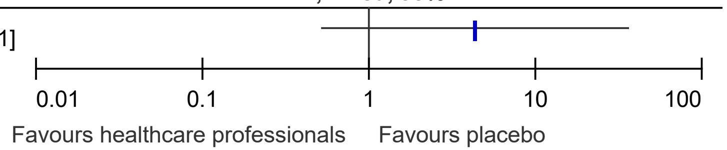
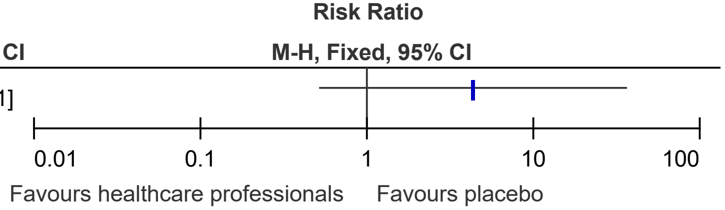


Figure 41: Withdrawal due to adverse events at ≥6 months

	Healthcare professionals		Placebo		Risk Ratio
Study or Subgroup	Events	Total	Events	Total	M-H, Fixed, 95% CI
Baylan 2020	4	23	1	25	4.35 [0.52, 36.11]



E.5 Music intervention delivered by healthcare professionals compared to no treatment

Figure 42: Person/participant generic health-related quality of life (SF-36 physical function, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Grau-Sanchez 2018	55.3	23.4	20	45	21.9	17	10.30 [-4.31, 24.91]

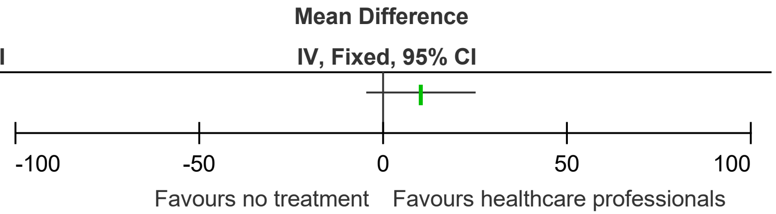


Figure 43: Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Grau-Sanchez 2018	56.7	27.5	20	50.4	33	17	6.30 [-13.48, 26.08]	

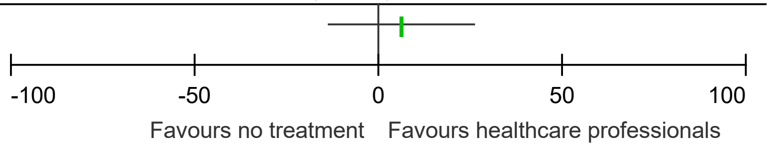


Figure 44: Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Grau-Sanchez 2018	17.6	32.8	20	23.7	38.6	17	-6.10 [-29.41, 17.21]	

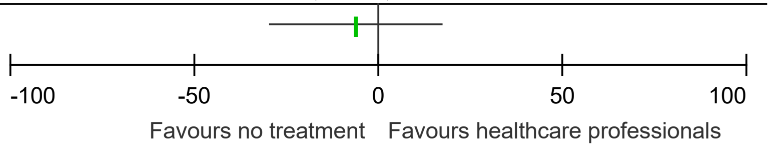


Figure 45: Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Grau-Sanchez 2018	60	20.3	20	53.2	26.8	17	6.80 [-8.74, 22.34]	

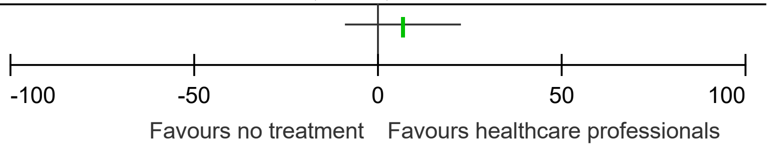


Figure 46: Person/participant generic health-related quality of life (SF-36 general health, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**IV, Fixed, 95% CI**	**IV, Fixed, 95% CI**
Grau-Sanchez 2018	61.1	18.4	20	57.2	22.7	17	3.90 [-9.57, 17.37]	

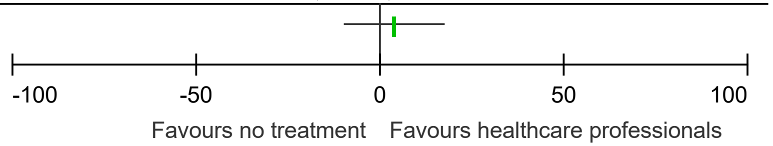


Figure 47: Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**IV, Fixed, 95% CI**	**IV, Fixed, 95% CI**
Grau-Sanchez 2018	76.5	40.4	20	70.9	42.9	17	5.60 [-21.41, 32.61]	

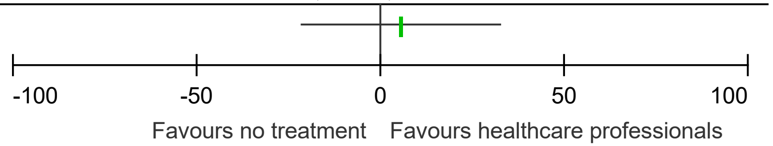


Figure 48: Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Grau-Sanchez 2018	71.1	21.2	20	66.3	21.6	17	4.80 [-9.05, 18.65]

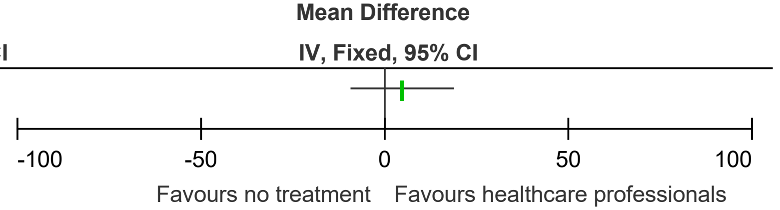


Figure 49: Person/participant generic health-related quality of life (SF-36 social function, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Grau-Sanchez 2018	75.7	27.5	20	64.7	30.7	17	11.00 [-7.93, 29.93]

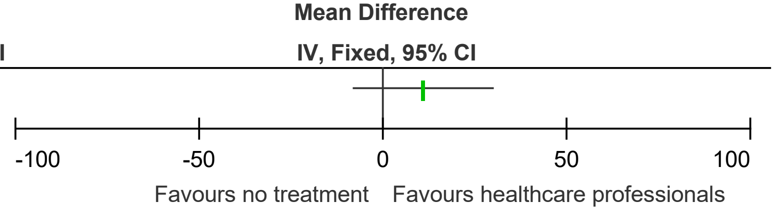


Figure 50: Person/participant health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final values) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Raglio 2021	6.85	1.81	13	7.34	1.24	16	-0.49 [-1.65, 0.67]

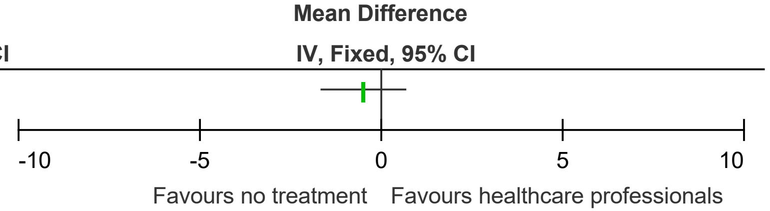


Figure 51: Activities of daily living (Canadian Occupational Performance Measure, University of Maryland Arm Questionnaire for Stroke, Activities of daily living score [different scale ranges], higher values are better, change scores) at <6 months

	Healthcare professionals			No treatment				Std. Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**
Hill 2011	15	5.57	6	10.2	16.18	4	22.7%	0.40 [-0.89, 1.68]
Lin 2017	18	5	30	12	5	30	44.6%	1.18 [0.63, 1.74]
Luft 2004	2	4.2	9	1.7	6.672406	10	32.7%	0.05 [-0.85, 0.95]
Total (95% CI)			**45**			**44**	**100.0%**	**0.64 [-0.15, 1.42]**

Heterogeneity: Tau² = 0.28; Chi² = 4.89, df = 2 (P = 0.09); I² = 59%

Test for overall effect: Z = 1.58 (P = 0.11)

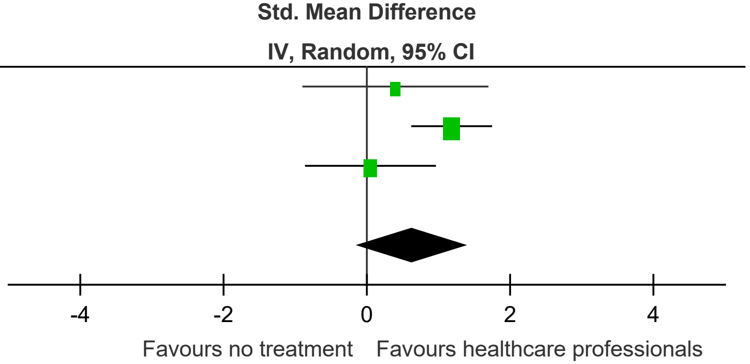


Figure 52: Activities of daily living (Barthel index, 0-100, higher values are better, final value) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**IV, Fixed, 95% CI**
Tian 2020	80.33	8.96	15	69.67	7.19	15	10.66 [4.85, 16.47]

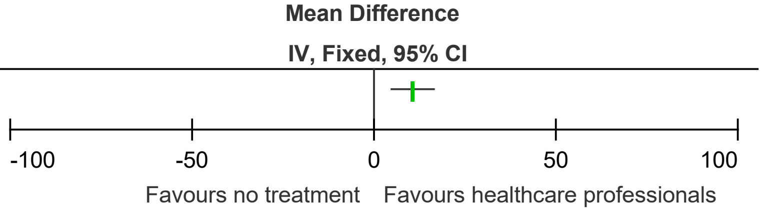


Figure 53: Psychological distress - Depression (Hamilton's Depression Scale-17, 0-56, lower values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Lin 2017	-6.2	2.1	30	-4.9	1.5	30	-1.30 [-2.22, -0.38]

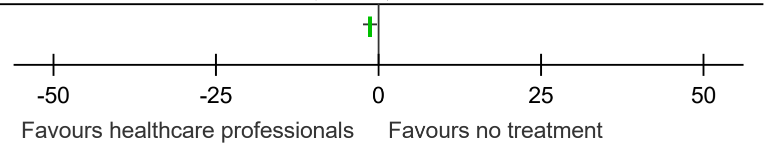


Figure 54: Psychological distress - Depression (BDI, Hamilton Depression Rating Scale-24, profile of mood states [different scale ranges], lower values are better, final values) at <6 months

	Healthcare professionals			No treatment				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Grau-Sanchez 2018	8.8	7.5	20	10.6	9.1	17	29.1%	-0.21 [-0.86, 0.44]
Jeong 2007	1.56	0.82	16	2.29	0.77	17	23.6%	-0.90 [-1.62, -0.18]
Zhao 2022	16.38	9.92	32	29.7	19.43	33	47.3%	-0.85 [-1.36, -0.34]
Total (95% CI)			**68**			**67**	**100.0%**	**-0.68 [-1.03, -0.33]**

Heterogeneity: Chi² = 2.76, df = 2 (P = 0.25); I² = 28%

Test for overall effect: Z = 3.78 (P = 0.0002)

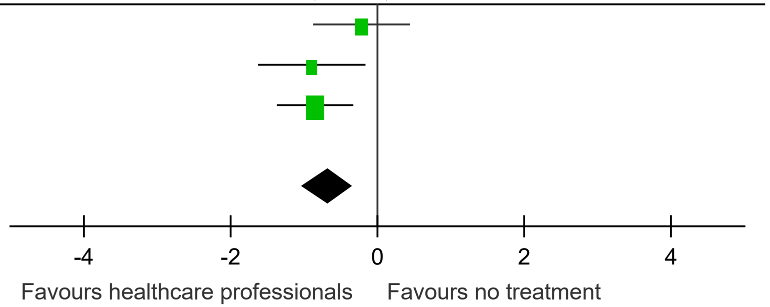


Figure 55: Psychological distress (PANAS positive affect, 10-50, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Grau-Sanchez 2018	33.7	9.3	20	30.3	7.3	17	3.40 [-1.95, 8.75]

Mean Difference
IV, Fixed, 95% CI

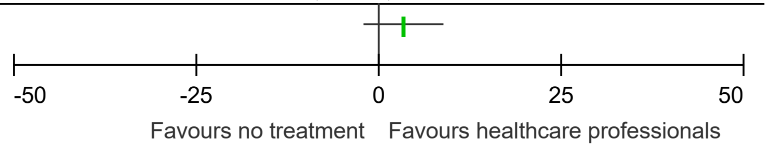


Figure 56: Stroke-specific Patient-Reported Outcome Measures (SIS [different scale ranges], higher values are better, change scores) at <6 months

	Healthcare professionals			No treatment				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Hill 2011	1.25	6.9	6	7.4	20	4	40.6%	-0.41 [-1.70, 0.87]
Whitall 2011	12	6.1	37	26	8.9	42	59.4%	-1.80 [-2.32, -1.27]
Total (95% CI)			**43**			**46**	**100.0%**	**-1.23 [-2.57, 0.10]**

Heterogeneity: Tau² = 0.70; Chi² = 3.79, df = 1 (P = 0.05); I² = 74%

Test for overall effect: Z = 1.82 (P = 0.07)

Std. Mean Difference
IV, Random, 95% CI

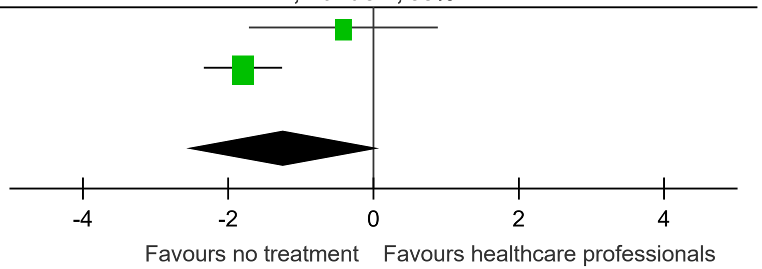


Figure 57: Stroke-specific Patient-Reported Outcome Measures (SIS strength subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	-1.1	13.1	17	11.7	13.1	15	-12.80 [-21.90, -3.70]

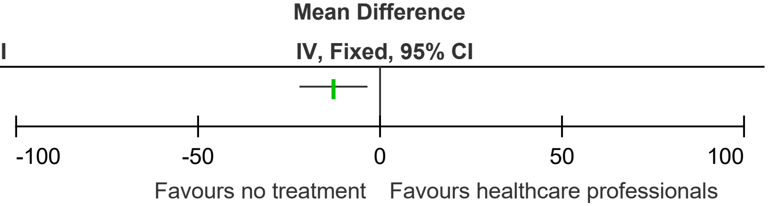


Figure 58: Stroke-specific Patient-Reported Outcome Measures (SIS memory subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	0.2	9.6	17	-0.9	8.2	15	1.10 [-5.07, 7.27]

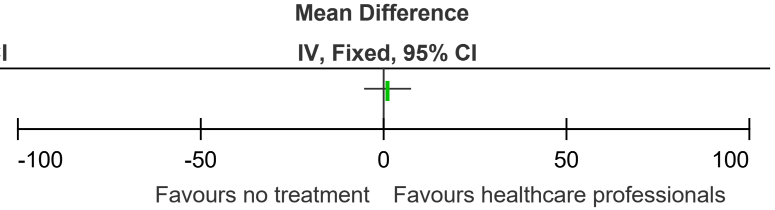


Figure 59: Stroke-specific Patient-Reported Outcome Measures (SIS emotion subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	5.8	18.1	17	3.9	11.7	15	1.90 [-8.54, 12.34]

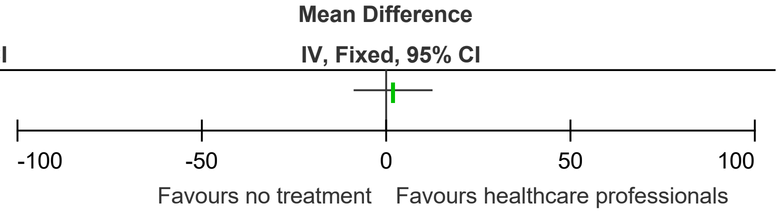


Figure 60: Stroke-specific Patient-Reported Outcome Measures (SIS communication subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	2.3	11.9	17	3.1	12.8	15	-0.80 [-9.40, 7.80]

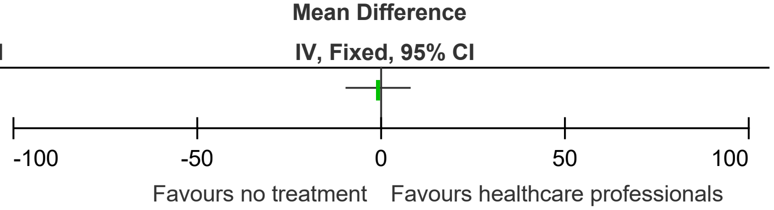


Figure 61: Stroke-specific Patient-Reported Outcome Measures (SIS ADL subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	2.8	13.5	17	0	12.7	15	2.80 [-6.28, 11.88]

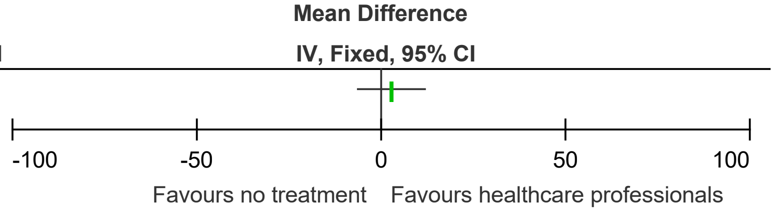


Figure 62: Stroke-specific Patient-Reported Outcome Measures (SIS mobility subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	1.8	7.3	17	3.1	10.4	15	-1.30 [-7.60, 5.00]

Mean Difference
IV, Fixed, 95% CI

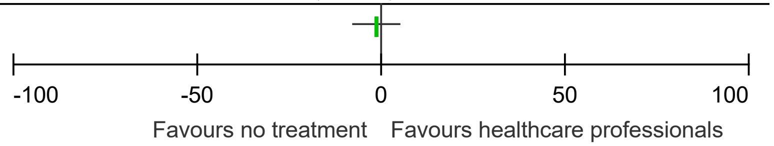


Figure 63: Stroke-specific Patient-Reported Outcome Measures (SIS hand function subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	11.5	22.8	17	9.7	22.6	15	1.80 [-13.96, 17.56]

Mean Difference
IV, Fixed, 95% CI

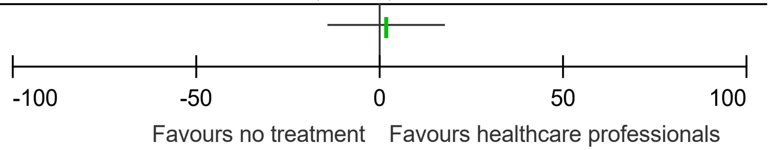


Figure 64: Stroke-specific Patient-Reported Outcome Measures (SIS social participation subscale, 0-100, higher values are better, change score) at <6 months

	Healthcare professionals			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
van Delden 2013 (ULTRA-Stroke)	6.8	19.3	17	3.1	20.5	15	3.70 [-10.15, 17.55]

Mean Difference
IV, Fixed, 95% CI

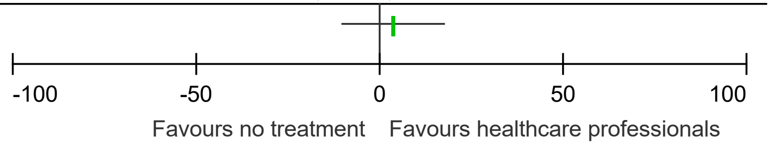


Figure 65: Stroke-specific Patient-Reported Outcome Measures (Stroke Specific Quality of Life [different scale ranges], higher values are better, final values) at <6 months

	Healthcare professionals			No treatment				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Grau-Sanchez 2018	185.9	38.8	20	183.5	23.4	18	52.7%	0.07 [-0.56, 0.71]
Jeong 2007	3.58	0.87	16	2.92	0.8	17	47.3%	0.77 [0.06, 1.48]
Total (95% CI)			**36**			**35**	**100.0%**	**0.40 [-0.28, 1.09]**

Heterogeneity: $Tau^2 = 0.13$; $Chi^2 = 2.06$, df = 1 (P = 0.15); $I^2 = 51\%$

Test for overall effect: Z = 1.16 (P = 0.25)

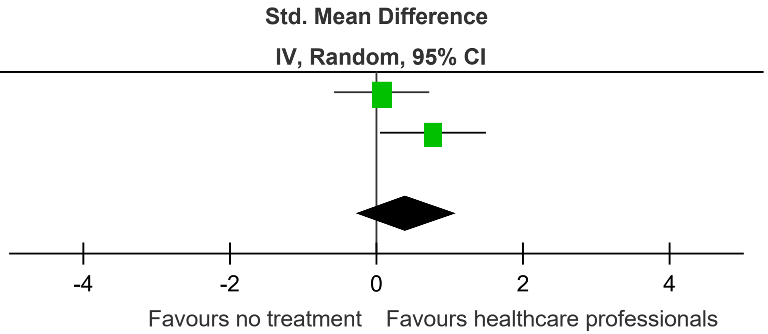
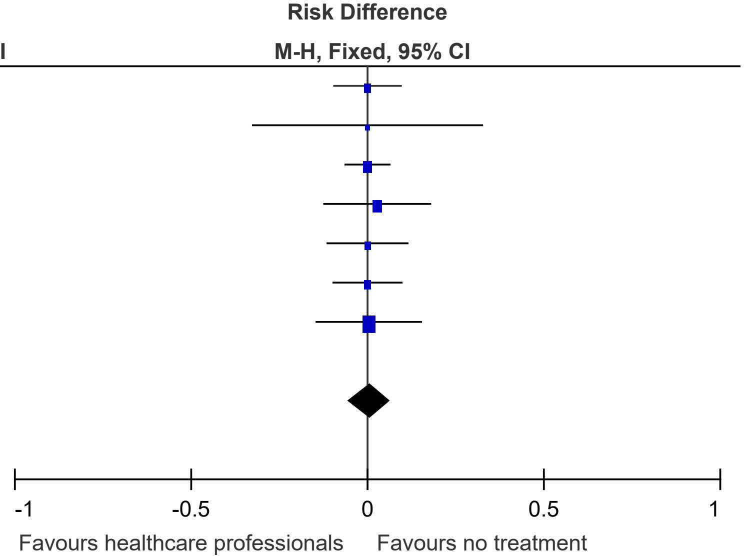


Figure 66: Withdrawal due to adverse events at <6 months

	Healthcare professionals		No treatment			Risk Difference
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI
Grau-Sanchez 2018	0	19	0	20	11.0%	0.00 [-0.09, 0.09]
Hill 2011	0	6	0	4	2.7%	0.00 [-0.32, 0.32]
Lin 2017	0	30	0	30	16.9%	0.00 [-0.06, 0.06]
Raglio 2021	4	33	3	32	18.3%	0.03 [-0.12, 0.18]
Tian 2020	0	16	0	16	9.0%	0.00 [-0.11, 0.11]
van Delden 2013 (ULTRA-Stroke)	0	19	0	19	10.7%	0.00 [-0.10, 0.10]
Whitall 2011	11	55	11	56	31.3%	0.00 [-0.14, 0.15]
Total (95% CI)		**178**		**177**	**100.0%**	**0.01 [-0.05, 0.07]**
Total events	15		14			

Heterogeneity: Chi² = 0.16, df = 6 (P = 1.00); I² = 0%
Test for overall effect: Z = 0.20 (P = 0.84)



E.6 Music intervention delivered by non-healthcare professionals compared to no treatment

Figure 67: Person/participant generic health-related quality of life (EQ-5D 5L, -0.11-1, higher values are better, final value) at <6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	0.683	0.265	17	0.727	0.239	19	-0.04 [-0.21, 0.12]

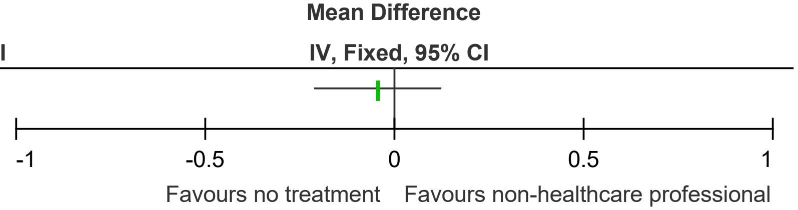


Figure 68: Person/participant generic health-related quality of life (EQ-5D 5L, -0.11-1, higher values are better, final value) at ≥6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	0.748	0.239	18	0.651	0.241	16	0.10 [-0.06, 0.26]

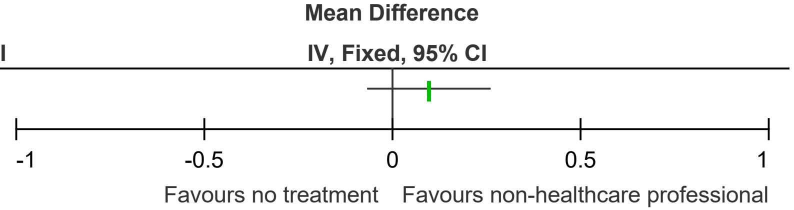


Figure 69: Carer generic health-related quality of life (CarerQoL-7D, 0-14, higher values are better, final value) at ≥6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	9	2.7	18	9	3.1	16	0.00 [-1.97, 1.97]

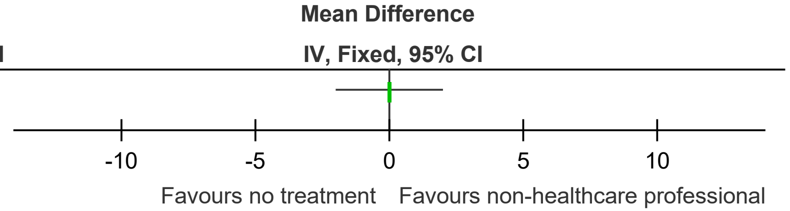


Figure 70: Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at <6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	3.6	0.8	17	3.6	0.7	19	0.00 [-0.49, 0.49]

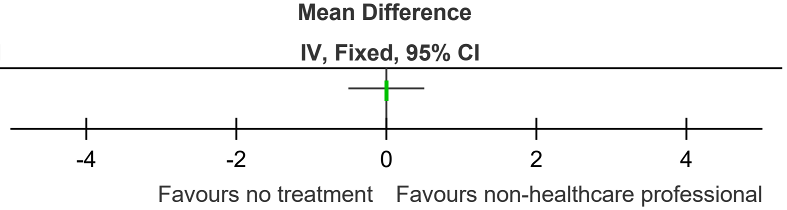


Figure 71: Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at ≥6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	3.7	0.8	18	3.4	0.7	16	0.30 [-0.20, 0.80]

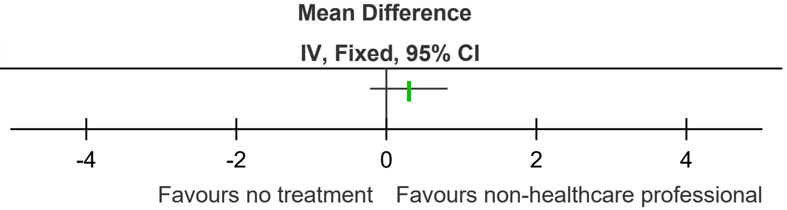


Figure 72: Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at <6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	0.819	0.096	17	0.748	0.818	19	0.07 [-0.30, 0.44]

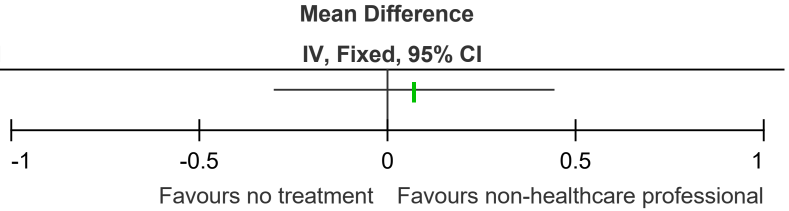


Figure 73: Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at <6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	23.1	5.3	17	22.1	8	19	1.00 [-3.39, 5.39]

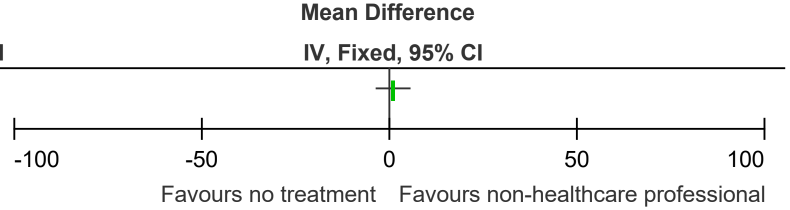


Figure 74: Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at ≥6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	0.813	0.1	18	0.777	0.162	16	0.04 [-0.06, 0.13]

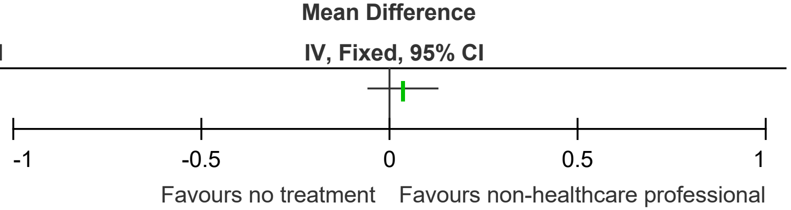


Figure 75: Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at ≥6 months

	Non-healthcare professional			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Tarrant 2021	23.9	6.2	18	22.1	7.5	16	1.80 [-2.86, 6.46]

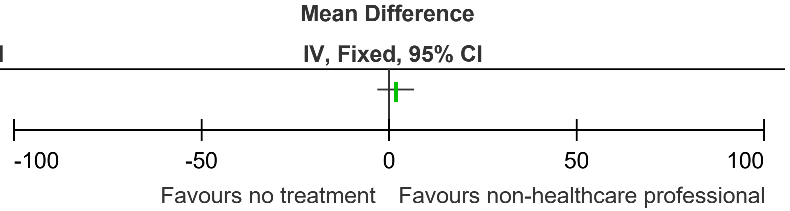
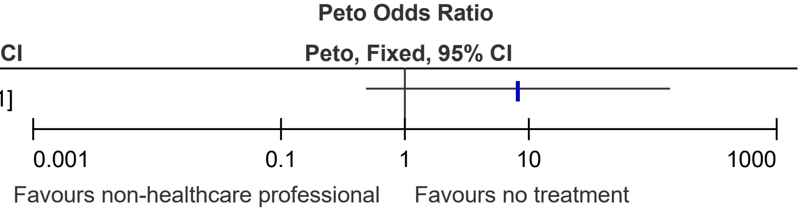


Figure 76: Withdrawal due to adverse events at <6 months

	Non-healthcare professional		No treatment		Peto Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Peto, Fixed, 95% CI
Tarrant 2021	2	20	0	21	8.19 [0.49, 135.71]



Appendix F – GRADE tables

F.1 Neurologic music therapy delivered by trained music therapists compared to no treatment

Table 16: Clinical evidence profile: neurologic music therapy delivered by trained music therapists compared to no treatment

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	neurologic music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (SF-36 physical functioning, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 physical functioning; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	30	31	-	MD **1.43 higher** (1.11 lower to 3.97 higher)	⊕◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 bodily pain; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	30	31	-	MD **0.47 higher** (0.78 lower to 1.72 higher)	⊕⊕◯◯ Low	CRITICAL
Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 role physical; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	30	31	-	MD **0.29 higher** (0.21 lower to 0.79 higher)	⊕⊕◯◯ Low	CRITICAL
Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 vitality; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	30	31	-	MD **4.11 higher** (2.34 higher to 5.88 higher)	⊕⊕◯◯ Low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	neurologic music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (SF-36 general health, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 general health; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	30	31	-	MD **1.46 higher** (0.25 lower to 3.17 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 role emotional; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	30	31	-	MD **0.83 higher** (0.34 higher to 1.32 higher)	⨁⨁◯◯ Low	CRITICAL
Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 mental health; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	30	31	-	MD **3.75 higher** (1.32 higher to 6.18 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 social functioning, 0-100, higher values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: SF-36 social functioning; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	30	31	-	MD **0.56 higher** (0.54 lower to 1.66 higher)	⨁⨁◯◯ Low	CRITICAL
Psychological distress - depression (Hamilton Depression Scale, 0-56, lower values are better, final value) at <6 months (follow-up: 8 weeks; assessed with: Hamilton Depression Scale; Scale from: 0 to 56)												
1	randomised trials	serious[c]	not serious	not serious	serious[b]	none	20	20	-	MD **1.95 lower** (3.07 lower to 0.83 lower)	⨁⨁◯◯ Low	CRITICAL
Psychological distress - anxiety (Hamilton Anxiety Rating Scale, 0-56, lower values are better, final value) at <6 months (follow-up: 8 weeks; assessed with: Hamilton Anxiety Rating Scale; Scale from: 0 to 56)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	neurologic music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	serious[c]	not serious	not serious	serious[b]	none	20	20	-	MD **1.05 lower** (2.46 lower to 0.36 higher)	⊕⊕◯◯ Low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke adjusted Sickness Impact Profile 30, 0-68, lower values are better, final values) at <6 months (follow-up: 5 weeks; assessed with: Stroke adjusted Sickness Impact Profile 30; Scale from: 0 to 68)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	30	31	-	MD **1.52 lower** (3.84 lower to 0.8 higher)	⊕◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference

Explanations

a. 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 and bias in measurement of the outcome)

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

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

F.2 Music therapy delivered by trained music therapists compared to no treatment

Table 17: Clinical evidence profile: music therapy delivered by trained music therapists compared to no treatment

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
Patient/participant generic health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final value) at <6 months (follow-up: 2 months; assessed with: McGill Quality of Life,; Scale from: 0 to 10)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	19	19	-	MD **0.27 higher** (0.7 lower to 1.24 higher)	⨁◯◯◯ Very low	CRITICAL
Activities of daily living (Korean-Modified Barthel Index, 0-100, higher values are better, change score) at <6 months (follow-up: 8 weeks; assessed with: Korean-Modified Barthel Index; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	not serious	very serious[b]	none	15	15	-	MD **2 higher** (13.25 lower to 17.25 higher)	⨁◯◯◯ Very low	CRITICAL
Activities of daily living (Functional independence measure, 18-126, higher values are better, final value) at <6 months (follow-up: 2 months; assessed with: Functional independence measure; Scale from: 18 to 126)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	19	19	-	MD **3.58 higher** (5.2 lower to 12.36 higher)	⨁⨁◯◯ Low	CRITICAL
Psychological distress - Depression (HADS-D, BDI, Faces scale, PANAS - negative affect [different scale ranges], lower values are better, final values) at <6 months (follow-up: mean 8 weeks; assessed with: HADS-D, BDI, Faces scale, PANAS - negative affect)												
5	randomised trials	very serious[d]	not serious	not serious	not serious	none	65	59	-	SMD **0.03 SD lower** (0.39 lower to 0.32 higher)	⨁⨁◯◯ Low	CRITICAL
Psychological distress - Depression (Center for Epidemiologic Studies Depression Scale, 0-60, lower values are better, change score) at <6 months (follow-up: 8 weeks; assessed with: Center for Epidemiologic Studies Depression Scale; Scale from: 0 to 60)												
1	randomised trials	very serious[c]	not serious	not serious	very serious[b]	none	15	15	-	MD **3.21 higher** (6.56 lower to 12.98 higher)	⨁◯◯◯ Very low	CRITICAL
Psychological distress - Anxiety (HADS-A, BAI [different scale ranges], lower values are better, final values) at <6 months (follow-up: mean 6 weeks; assessed with: HADS-A, BAI)												
2	randomised trials	very serious[e]	not serious	not serious	serious[b]	none	28	28	-	SMD **0.18 SD lower** (0.7 lower to 0.35 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
Psychological distress (PANAS - positive affect, 10-50, higher values are better, final value) at <6 months (follow-up: 4 months; assessed with: PANAS - positive affect; Scale from: 10 to 50)												
1	randomised trials	not serious	not serious	not serious	serious[b]	none	14	14	-	MD **4.15 higher** (2.01 lower to 10.31 higher)	⨁⨁⨁◯ Moderate	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke specific quality of life, 49-245, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: Stroke specific quality of life; Scale from: 49 to 245)												
1	randomised trials	very serious[e]	not serious	not serious	serious[b]	none	10	10	-	MD **24.5 higher** (7.36 higher to 41.64 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS physical strength, 0-100, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: SIS physical strength; Scale from: 0 to 100)												
1	randomised trials	very serious[f]	not serious	serious[g]	serious[b]	none	13	12	-	MD **10.7 lower** (23.83 lower to 2.43 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS activities, 0-100, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: SIS activities; Scale from: 0 to 100)												
1	randomised trials	very serious[f]	not serious	serious[g]	serious[b]	none	13	12	-	MD **6.4 lower** (20.13 lower to 7.33 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS hand use, 0-100, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: SIS hand use; Scale from: 0 to 100)												
1	randomised trials	very serious[f]	not serious	serious[g]	serious[b]	none	13	12	-	MD **12 lower** (33.74 lower to 9.74 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS mobility, 0-100, higher values are better, final value) at <6 months (follow-up: mean 11 weeks; assessed with: SIS mobility; Scale from: 0 to 100)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
2	randomised trials	not serious	not serious	not serious	serious[b]	none	27	26	-	MD **4.96 lower** (13.36 lower to 3.44 higher)	⊕⊕⊕◯ Moderate	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS communication, 0-100, higher values are better, final value) at <6 months (follow-up: mean 11 weeks; assessed with: SIS communication; Scale from: 0 to 100)												
1	randomised trials	not serious	not serious	not serious	serious[b]	none	27	26	-	MD **1.89 lower** (8.05 lower to 4.27 higher)	⊕⊕⊕◯ Moderate	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS memory, 0-100, higher values are better, final value) at <6 months (follow-up: mean 11 weeks; assessed with: SIS memory; Scale from: 0 to 100)												
1	randomised trials	very serious[f]	not serious	serious[g]	serious[b]	none	27	26	-	MD **0.65 lower** (9.93 lower to 8.64 higher)	⊕◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS emotion, 0-100, higher values are better, final value) at <6 months (follow-up: mean 11 weeks; assessed with: SIS emotion; Scale from: 0 to 100)												
1	randomised trials	not serious	not serious	serious[g]	serious[b]	none	27	26	-	MD **1.01 higher** (7.7 lower to 9.72 higher)	⊕⊕◯◯ Low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS social/participation, 0-100, higher values are better, final value) at <6 months (follow-up: mean 11 weeks; assessed with: SIS social; Scale from: 0 to 100)												
1	randomised trials	not serious	not serious	serious[g]	serious[b]	none	27	26	-	MD **2.38 lower** (12.84 lower to 8.08 higher)	⊕⊕◯◯ Low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS recovery, 0-100, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: SIS recovery; Scale from: 0 to 100)												
1	randomised trials	very serious[f]	not serious	serious[g]	very serious[b]	none	13	12	-	MD **1.2 lower** (13.66 lower to 11.26 higher)	⊕◯◯◯ Very low	CRITICAL
Wellbeing scores (WHO five item well-being index, 0-25, higher values are better, final value) at <6 months (follow-up: 6 weeks; assessed with: WHO five item well-being index; Scale from: 0 to 25)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music therapy delivered by trained music therapists	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[f]	not serious	serious[g]	serious[b]	none	13	12	-	MD **2.4 higher** (1.71 lower to 6.51 higher)	⊕◯◯◯ Very low	CRITICAL
Participation in leisure activities/social groups (Sickness Impact Profile Social Interaction subscale, 0-102, lower values are better, final value) at <6 months (follow-up: 4 months; assessed with: Sickness Impact Profile Social Interaction subscale,; Scale from: 0 to 102)												
1	randomised trials	very serious[e]	not serious	serious[h]	not serious	none	10	8	-	MD **13.28 lower** (19.7 lower to 6.86 lower)	⊕◯◯◯ Very low	CRITICAL
Withdrawal due to adverse events at <6 months (follow-up: 7 weeks)												
4	randomised trials	serious[i]	not serious	not serious	serious[j]	none	0/43 (0.0%)	0/41 (0.0%)	**RD 0.00** (-0.09 to 0.09)	**0 fewer per 1,000** (from 90 fewer to 90 more)[k]	⊕⊕◯◯ Low	CRITICAL

CI: confidence interval; **MD:** mean difference; **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 arising from the randomisation process and bias due to deviations from the intended interventions)

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

c. 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)

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, bias due to missing outcome data and bias in measurement of the outcome)

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 and bias in measurement of the outcome)

f. 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)

g. Downgraded by 1 increment due to comparator indirectness (due to the comparator group in 1 study receiving an exercise intervention that may have been more intense than that received than the intervention group, however it was unclear as to whether this was the case from the information provided in the study)

h. Downgraded by 1 increments due to population indirectness (10-20% of people in a study having had a traumatic brain injury rather than a stroke)

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

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

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

F.3 Music interventions delivered by healthcare professionals compared to passive music listening

Table 18: Clinical evidence profile: music interventions delivered by healthcare professionals compared to passive music listening

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	passive music listening	Relative (95% CI)	Absolute (95% CI)		
Withdrawal due to adverse events at <6 months (follow-up: 3 months)												
1	randomised trials	serious[a]	not serious	not serious	very serious[b]	none	4/23 (17.4%)	1/25 (4.0%)	**RR 4.35** (0.52 to 36.11)	**134 more per 1,000** (from 19 fewer to 1,000 more)	⨁◯◯◯ Very low	CRITICAL
Withdrawal due to adverse events at ≥6 months (follow-up: 6 months)												
1	randomised trials	serious[a]	not serious	not serious	very serious[b]	none	4/23 (17.4%)	1/25 (4.0%)	**RR 4.35** (0.52 to 36.11)	**134 more per 1,000** (from 19 fewer to 1,000 more)	⨁◯◯◯ Very low	CRITICAL

CI: confidence interval; **RR:** risk ratio

Explanations

a. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to missing outcome data)

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

F.4 Music interventions delivered by healthcare professionals compared to placebo music therapy

Table 19: Clinical evidence profile: music interventions delivered by healthcare professionals compared to placebo music therapy

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	placebo music therapy	Relative (95% CI)	Absolute (95% CI)		
Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean difference) at <6 months (follow-up: 3 months; assessed with: HADS-D; Scale from: 0 to 42)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	23	25	-	MD **0.7 higher** (1.65 lower to 3.05 higher)	⊕◯◯◯ Very low	CRITICAL
Psychological distress - Depression (HADS-D, 0-42, higher values are better, mean difference) at ≥6 months (follow-up: 6 months; assessed with: HADS-D; Scale from: 0 to 42)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	23	25	-	MD **1.02 higher** (1.36 lower to 3.4 higher)	⊕◯◯◯ Very low	CRITICAL
Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at <6 months (follow-up: 3 months; assessed with: HADS-A; Scale from: 0 to 42)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	23	25	-	MD **0.69 higher** (1.47 lower to 2.85 higher)	⊕◯◯◯ Very low	CRITICAL
Psychological distress - Anxiety (HADS-A, 0-42, higher values are better, mean difference) at ≥6 months (follow-up: 6 months; assessed with: HADS-A; Scale from: 0 to 42)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	23	25	-	MD **2 higher** (0.28 lower to 4.28 higher)	⊕◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	placebo music therapy	Relative (95% CI)	Absolute (95% CI)		
Participation in leisure activities/social group scores (Mayo-Portland Adaptability Inventory 4 participation, 0-30, higher values are better, mean difference) at <6 months (follow-up: 3 months; assessed with: Mayo-Portland Adaptability Inventory 4 participation; Scale from: 0 to 30)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	23	25	-	MD **1.72 higher** (11.75 lower to 15.19 higher)	⊕⊕◯◯ Low	CRITICAL
Withdrawal due to adverse events at <6 months (follow-up: 3 months)												
1	randomised trials	serious[c]	not serious	not serious	very serious[b]	none	4/23 (17.4%)	1/25 (4.0%)	**RR 4.35** (0.52 to 36.11)	**134 more per 1,000** (from 19 fewer to 1,000 more)	⊕◯◯◯ Very low	CRITICAL
Withdrawal due to adverse events at ≥6 months (follow-up: 6 months)												
1	randomised trials	serious[c]	not serious	not serious	very serious[b]	none	4/23 (17.4%)	1/25 (4.0%)	**RR 4.35** (0.52 to 36.11)	**134 more per 1,000** (from 19 fewer to 1,000 more)	⊕◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference; **RR:** risk ratio

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 and bias due to missing outcome data)

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

c. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias due to missing outcome data)

F.5 Music interventions delivered by healthcare professionals compared to no treatment

2 **Table 20: Clinical evidence profile: music interventions delivered by healthcare professionals compared to no treatment**

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (SF-36 physical function, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 physical function; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **10.3 higher** (4.31 lower to 24.91 higher)	⊕◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 bodily pain, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 bodily pain,; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **6.3 higher** (13.48 lower to 26.08 higher)	⊕◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 role physical, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 role physical; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **6.1 lower** (29.41 lower to 17.21 higher)	⊕◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 vitality, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 vitality; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **6.8 higher** (8.74 lower to 22.34 higher)	⊕◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 general health, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 general health; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **3.9 higher** (9.57 lower to 17.37 higher)	⊕◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (SF-36 role emotional, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 role emotional; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **5.6 higher** (21.41 lower to 32.61 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 mental health, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 mental health; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	20	17	-	MD **4.8 higher** (9.05 lower to 18.65 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 social function, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; assessed with: SF-36 social function; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	not serious	very serious[b]	none	20	17	-	MD **11 higher** (7.93 lower to 29.93 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant health-related quality of life (McGill Quality of Life, 0-10, higher values are better, final value) at <6 months (follow-up: 2 months; assessed with: McGill Quality of Life; Scale from: 0 to 10)												
1	randomised trials	very serious[d]	not serious	not serious	not serious	none	13	16	-	MD **0.49 lower** (1.65 lower to 0.67 higher)	⨁⨁◯◯ Low	CRITICAL
Activities of daily living (Canadian Occupational Performance Measure, University of Maryland Arm Questionnaire for Stroke, Activities of daily living score [different scale ranges], higher values are better, change scores) at <6 months (follow-up: 6 weeks; assessed with: Canadian Occupational Performance Measure, University of Maryland Arm Questionnaire for Stroke, Activities of daily living score)												
3	randomised trials	very serious[e]	serious[f]	not serious	serious[b]	none	45	44	-	SMD **0.64 SD higher** (0.15 lower to 1.42 higher)	⨁◯◯◯ Very low	CRITICAL
Activities of daily living (Barthel index, 0-100, higher values are better, final value) at <6 months (follow-up: 4 weeks; Scale from: 0 to 100)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[g]	not serious	not serious	not serious	none	15	15	-	MD **10.66 higher** (4.85 higher to 16.47 higher)	⨁⨁◯◯ Low	CRITICAL
Psychological distress - Depression (Hamilton's Depression Scale-17, 0-56, lower values are better, change score) at <6 months (follow-up: 17 days; assessed with: Hamilton's Depression Scale-17; Scale from: 0 to 56)												
1	randomised trials	very serious[e]	not serious	not serious	serious[b]	none	30	30	-	MD **1.3 lower** (2.22 lower to 0.38 lower)	⨁◯◯◯ Very low	CRITICAL
Psychological distress - Depression (BDI, Hamilton Depression Rating Scale-24, profile of mood states [different scale ranges], lower values are better, final values) at <6 months (follow-up: mean 6 weeks; assessed with: BDI, Hamilton Depression Rating Scale-24, profile of mood states)												
3	randomised trials	very serious[h]	not serious	not serious	serious[b]	none	68	67	-	SMD **0.68 SD lower** (1.03 lower to 0.33 lower)	⨁◯◯◯ Very low	CRITICAL
Psychological distress (PANAS positive affect, 10-50, higher values are better, change score) at <6 months (follow-up: 4 weeks; assessed with: PANAS positive affect; Scale from: 10 to 50)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	20	17	-	MD **3.4 higher** (1.95 lower to 8.75 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS [different scale ranges], higher values are better, change scores) at <6 months (follow-up: 8 weeks)												
2	randomised trials	very serious[h]	serious[f]	not serious	serious[b]	none	43	46	-	SMD **1.23 SD lower** (2.57 lower to 0.1 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS strength subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS strength subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	serious[b]	none	17	15	-	MD **12.8 lower** (21.9 lower to 3.7 lower)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Stroke-specific Patient-Reported Outcome Measures (SIS memory subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS memory subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **1.1 higher** (5.07 lower to 7.27 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS emotion subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS emotion subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **1.9 higher** (8.54 lower to 12.34 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS communication subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS communication subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **0.8 lower** (9.4 lower to 7.8 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS ADL subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS ADL subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	serious[b]	none	17	15	-	MD **2.8 higher** (6.28 lower to 11.88 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS mobility subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS mobility subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **1.3 lower** (7.6 lower to 5 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SIS hand function subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS hand function subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **1.8 higher** (13.96 lower to 17.56 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Stroke-specific Patient-Reported Outcome Measures (SIS social participation subscale, 0-100, higher values are better, change score) at <6 months (follow-up: 12 weeks; assessed with: SIS social participation subscale; Scale from: 0 to 100)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[b]	none	17	15	-	MD **3.7 higher** (10.15 lower to 17.55 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke Specific Quality of Life [different scale ranges], higher values are better, final values) at <6 months (follow-up: mean 6 weeks; assessed with: Stroke Specific Quality of Life)												
2	randomised trials	very serious[h]	serious[f]	not serious	serious[b]	none	36	35	-	SMD **0.4 SD higher** (0.28 lower to 1.09 higher)	⨁◯◯◯ Very low	CRITICAL
Withdrawal due to adverse events at <6 months (follow-up: mean 7 weeks)												
7	randomised trials	serious[j]	serious[k]	not serious	very serious[l]	none	15/178 (8.4%)	14/177 (7.9%)	**RD 0.01** (-0.05 to 0.07)	**10 fewer per 1,000** (from 70 fewer to 50 more)[m]	⨁◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference; **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 arising from the randomisation process, bias due to deviations from the intended interventions and bias in selection of the reported result)

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

c. 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 in selection of the reported result)

d. 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)

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 and bias in measurement of the outcome)

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

g. 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)

h. 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)

i. 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)

j. 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, bias in measurement of the outcome and bias in selection of the reported result)

k. Downgraded for heterogeneity due to conflicting number of events in different studies (zero events in one or more studies)

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

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

F.6 Music interventions delivered by non-healthcare professionals compared to no treatment

Table 21: Clinical evidence profile: music interventions delivered by non-healthcare professionals compared to no treatment

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by non-healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (EQ-5D 5L, -0.11-1, higher values are better, final value) at <6 months (follow-up: 3 months; assessed with: EQ-5D 5L; Scale from: -0.11 to 1)												
1	randomised trials	serious[a]	not serious	not serious	very serious[b]	none	17	19	-	MD **0.04 lower** (0.21 lower to 0.12 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (EQ-5D 5L, -0.11-1, higher values are better, final value) at ≥6 months (follow-up: 6 months; assessed with: EQ-5D 5L; Scale from: -0.11 to 1)												
1	randomised trials	very serious[c]	not serious	not serious	very serious[b]	none	18	16	-	MD **0.1 higher** (0.06 lower to 0.26 higher)	⨁◯◯◯ Very low	CRITICAL
Carer generic health-related quality of life (CarerQoL-7D, 0-14, higher values are better, final value) at ≥6 months (follow-up: 6 months; assessed with: CarerQoL-7D; Scale from: 0 to 14)												
1	randomised trials	very serious[c]	not serious	not serious	very serious[b]	none	18	16	-	MD **0** (1.97 lower to 1.97 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by non-healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at <6 months (follow-up: 3 months; assessed with: Stroke and Aphasia Quality of Life; Scale from: 1 to 5)												
1	randomised trials	serious[a]	not serious	not serious	very serious[b]	none	17	19	-	MD **0** (0.49 lower to 0.49 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke and Aphasia Quality of Life, 1-5, higher values are better, final value) at ≥6 months (follow-up: 6 months; assessed with: Stroke and Aphasia Quality of Life; Scale from: 1 to 5)												
1	randomised trials	very serious[c]	not serious	not serious	serious[b]	none	18	16	-	MD **0.3 higher** (0.2 lower to 0.8 higher)	⨁◯◯◯ Very low	CRITICAL
Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at <6 months (follow-up: 3 months; assessed with: ICEpop CAPability measure for adults,; Scale from: 0 to 1)												
1	randomised trials	very serious[d]	not serious	not serious	very serious[b]	none	17	19	-	MD **0.07 higher** (0.3 lower to 0.44 higher)	⨁◯◯◯ Very low	CRITICAL
Wellbeing scores (ICEpop CAPability measure for adults, 0-1, higher values are better, final value) at ≥6 months (follow-up: 6 months; assessed with: ICEpop CAPability measure for adults; Scale from: 0 to 1)												
1	randomised trials	very serious[d]	not serious	not serious	serious[b]	none	18	16	-	MD **0.04 higher** (0.06 lower to 0.13 higher)	⨁◯◯◯ Very low	CRITICAL
Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at <6 months (follow-up: 3 months; assessed with: modified Reintegration to Normal Living Index,; Scale from: 0 to 100)												
1	randomised trials	serious[a]	not serious	not serious	serious[b]	none	17	19	-	MD **1 higher** (3.39 lower to 5.39 higher)	⨁⨁◯◯ Low	CRITICAL
Participation in leisure activities/social groups scores (modified Reintegration to Normal Living Index, 0-100, higher values are better, final value) at ≥6 months (follow-up: 6 months; assessed with: modified Reintegration to Normal Living Index; Scale from: 0 to 100)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	music intervention delivered by non-healthcare professionals	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[c]	not serious	not serious	serious[b]	none	18	16	-	MD **1.8 higher** (2.86 lower to 6.46 higher)	⊕◯◯◯ Very low	CRITICAL
Withdrawal due to adverse events at <6 months (follow-up: 3 months)												
1	randomised trials	not serious	not serious	not serious	very serious[b]	none	2/20 (10.0%)	0/21 (0.0%)	**OR 8.19** (0.49 to 135.71)	**100 more per 1,000** (from 50 fewer to 250 more)[e]	⊕⊕◯◯ Low	CRITICAL

CI: confidence interval; **MD:** mean difference; **OR:** odds ratio

Explanations

a. 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)

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

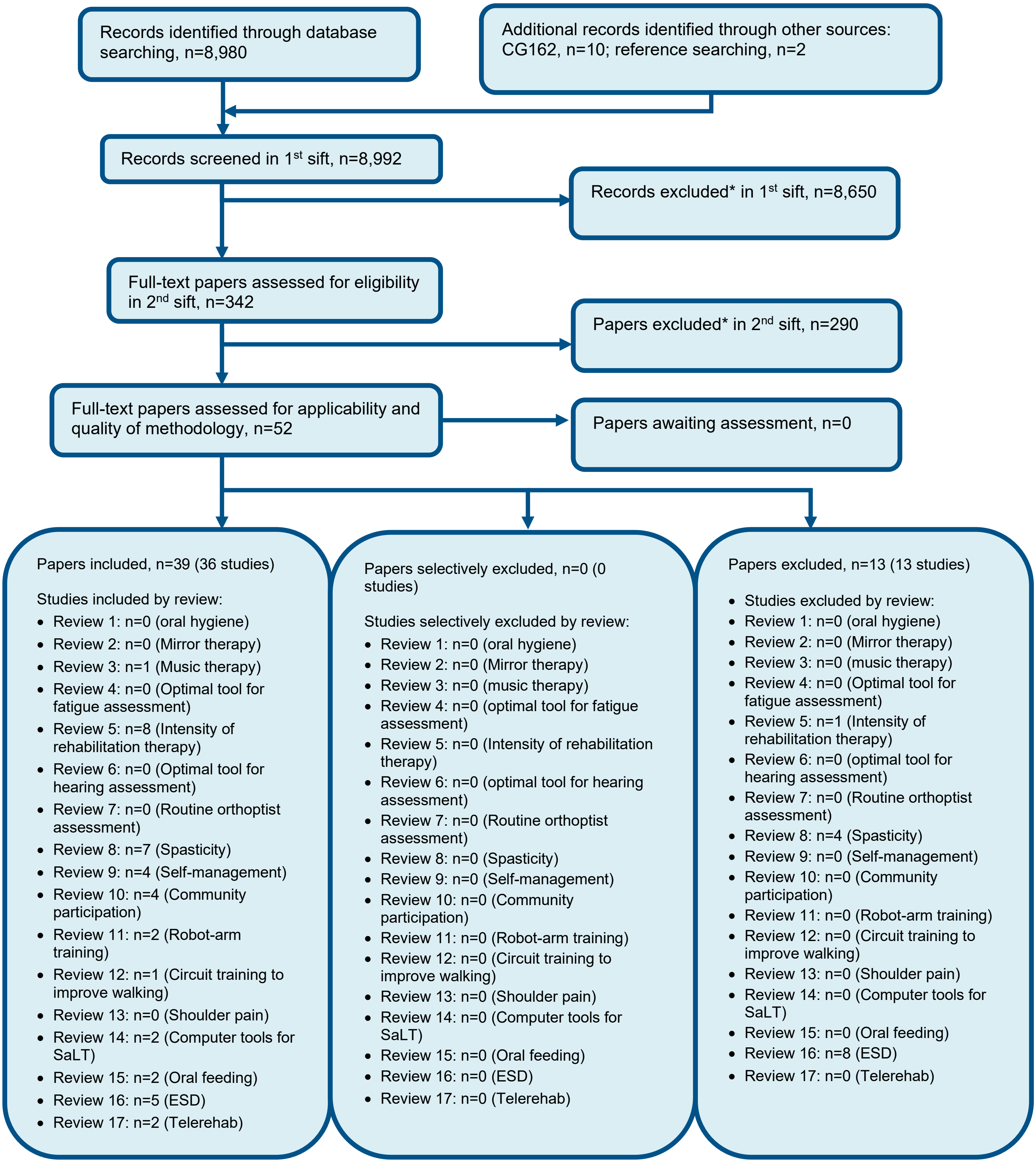
c. Downgraded by 2 increments as the majority of the evidence was of very high risk of bias (due to bias due to deviations from the intended interventions and bias due to missing outcome data)

d. 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 and bias due to missing outcome data)

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

Appendix G – Economic evidence study selection

Figure 22: 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

Study	Tarrant et al. 2021{Tarrant, 2021 #1500}			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: CUA (health outcome: QALYs) **Study design:** Within trial analysis (RCT – same paper) (note the study aims to investigate acceptability and feasibility of a definitive RCT that would include full cost effectiveness assessment.) **Approach to analysis:** A micro-costing approach was adopted to estimate the intervention costs associated with SPA. Other healthcare resource use was collected but not included in cost analysis. **Perspective:** UK. It is not stated that an NHS and PSS perspective is taken however, the costs included are all considered relevant if	**Population:** Adults with post-stroke aphasia **Patient characteristics** N=41 Mean age: 66.5 years (SD:10.3) Male: 61% **Intervention 1:** Control group (no treatment) **Intervention 2:** Singing groups for people with aphasia (SPA), sessions held for 90 minutes, once a week for 10 weeks led by a music facilitator and assisted by an individual with poststroke aphasia.	**Total costs (mean per patient):** Intervention 1: £0 Intervention 2: £399 Incremental (2−1): £399[(a)] (95% CI: NR; p=NR) **Currency & cost year:** 2019 UK pounds **Cost components incorporated:** Training costs, staff time during training and delivery of the intervention, travel costs for facilitators and singing champions, course materials (song books, percussion instruments, badges and flip charts), venue costs and refreshments. Note that other healthcare resource use was collected but not included in cost analysis (authors note the objective of the study was to assess feasibility of collection).	From clinical review (2 vs 1) – same paper: **EQ-5D-5L scores** [(b)] 3-month follow-up: -0.04 (95% CI: -0.21, 0.12) 6-month follow-up: 0.10 (95% CI: -0.06, 0.26) **QALY gained (2 vs 1):** 0.05 **Carer generated health-related quality of life (CarerQoL-7D)** [(b)] 3-month follow-up: NR 6-month follow-up: 0.00 (95% CI: -1.97, 1.97) Other outcomes were reported and can be seen in clinical evidence table.	**ICER (Intervention 2 versus Intervention 1):** £7,980 per QALY gained[(c)] Probability Intervention 2 cost effective (£20K/30K threshold): NR **Analysis of uncertainty:** None.

the intervention is funded by the NHS. **Follow-up:** 6 months **Discounting:** Costs: n/a; Outcomes: n/a		Health resource use included primary care (GP and nurse), secondary care (hospital admissions and accident and emergency) and social care. The study did not present differences in other resource use as costs but these were higher for the intervention group so inclusion of such costs could impact results.		
Data sources				
Health outcomes: Within-RCT analysis (same paper, included in the clinical review) – UK setting. **Quality-of-life weights:** QALYs were not reported but these were calculated for this review using EQ-5D-5L scores collected in the study (UK population valuation tariff). **Cost sources:** Within-trial analysis – micro-costing from 3 centres involved in trial. Total costs associated with providing therapy were calculated and then divided by number of participants to give cost per participant. Costs were inflated to 2019 using the Adult Personal Social Services pay and prices index inflation index reported in PSSRU unit costs report 2019. Other health and social care resource use was collected using self-reported data but not included in cost analysis (authors note the objective of the study was to assess feasibility of collection).				
Comments				
Source of funding: Stroke Association. **Limitations**: Mean EQ-5D-5L scores (UK tariff) at 6-months were used to calculate the cost per QALY gained for this review: the NICE reference case currently prefers EQ5D-3L. It is not stated that an NHS and PSS perspective is taken however, if the costs included are all considered relevant if the intervention is funded by the NHS. 6-month time horizon may not capture full health benefits of the intervention if these persist. Pilot feasibility RCT (n=41) that was not powered to test the effectiveness of the intervention or differences in healthcare resource use; the aim was to inform a future study where effectiveness and cost-effectiveness could be assessed. Within-trial analysis only reflects health outcomes and resource use from single trial; however, as this was the only trial included in the clinical review for music interventions delivered by non-healthcare professionals and so reflects the best currently available evidence. It is unclear if all relevant costs are included; interventions costs were included but other healthcare resource use was collected but not included; other healthcare resource used was numerically higher with the interventions but authors note the study was not powered to detect differences and did not present these as costs. Sensitivity analysis was not performed. **Other:** none.				
Overall applicability: Partially applicable(d) **Overall quality:** Potentially serious limitations(e)				

Abbreviations: 95% CI= 95% confidence interval; CUA= cost-utility analysis; ICER= incremental cost-effectiveness ratio; NA = not applicable; NR= not reported; QALYs= quality-adjusted life years.
(a) See Table 21 for cost breakdown.
(b) Mean difference taken from figures 60, 65 and 66 of guideline clinical review.
(c) Cost per QALY gained not reported but was estimated using 6-month EQ-5D-5L scores collected within the study and assuming no difference in mortality.
(d) Directly applicable / Partially applicable / Not applicable
(e) Minor limitations / Potentially serious limitations / Very serious limitations

Table 22: Course running costs based on three community-based cohorts in the South West of England{Tarrant, 2021 #1500}

Item	Total cost (£)
Salary	
Music facilitators	£2,725.00
Music facilitator training	£743.75
Singing champion*	£675.00
Trainer	£310.08
Administrator cohort set-up (42 hours)	£1,008.00
Senior coordinator of sessions (15.25 hours)	£367.20
Junior coordinator of sessions (20 hours)	£223.51
Sub-total (training costs)	£1,095.29
Sub-total (salary)	£6,662.35
Course	
Facilitator travel	£0.00
Singing champion travel	£425.45
Course materials	£91.91
Hospitality (venue costs)	£718.02
Refreshments	£88.82
Sub-total (course)	£1,324.20
Total cost of intervention for (salary + course)	£7,986.55
Cost per participant (including training)	**£399.33**
Cost per participant (excluding training)	£344.56
Cost per participant (excluding training and assistance during singing sessions which may be provided by another carer)	£325.62

**unit cost based on experience of within trial payment of £25 in 2017 prices and adjusted to 2019 prices*

Appendix I – Health economic model

New cost-effectiveness analysis was not conducted in this area.

1 # Appendix J – Excluded studies

2 ## Clinical studies

3 **Table 22: Studies excluded from the clinical review**

Study	Code [Reason]
Acalha, T., Mg, Suzuki, S. O. et al. (2010) Effects of the task oriented and auditory cues for chronic stroke patients. Revista terapia manual 8(39): 441-447	- Full text paper not available
Ala-Ruona, E. (2009) Active music therapy for post-stroke recovery.	- Full text paper not available
Altenmuller, E., Marco-Pallares, J., Munte, T. F. et al. (2009) Neural reorganization underlies improvement in stroke-induced motor dysfunction by music-supported therapy. Annals of the New York Academy of Sciences 1169: 395-405	- Study reported outcomes that were not included in the protocol
Anonymous (2008) Music in stroke rehabilitation. Lancet 371(9614): 698	- Commentary only
Aravantinou-Fatorou, K. and Fotakopoulos, G. (2021) Efficacy of exercise rehabilitation program accompanied by experiential music for recovery of aphasia in single cerebrovascular accidents: a randomized controlled trial. Irish Journal of Medical Science 190(2): 771-778	- Data not reported in an extractable format or a format that can be analysed
Argstatter, H., Hillecke, Th, Thaut, M. et al. (2007) Music therapy in motor rehabilitation. Evaluation of a musico-medical gait training program for hemiparetic stroke patients. Neurologie und rehabilitation 13(3): 159-165	- Study not reported in English
Bamiou, D. E. (2016) Auditory rehabilitation in stroke patients with auditory processing disorders.	- Full text paper not available
Barnes, C. L., Smith, M. B., Harriet, E. et al. (2006) A pilot study of bilateral arm training with repetitive auditory cueing in subjects with low functioning upper limb hemiparesis as a result of chronic stroke. Journal of neurologic physical therapy 4: 221	- Conference abstract

Study	Code [Reason]
Baylan, S., Quinn, T., Cullen, B. et al. (2016) The effects of music listening on mood and cognition post-stroke. International journal of stroke 11(suppl4): 29	- Study not reported in English
Baylan, S., Swann-Price, R., Peryer, G. et al. (2016) The effects of music listening interventions on cognition and mood post-stroke: a systematic review. Expert Review of Neurotherapeutics 16(11): 1241-1249	- Systematic review used as source of primary studies
Bittman, B., Poornima, I., Smith, M. A. et al. (2020) Gospel Music: A Catalyst for Retention, Engagement, and Positive Health Outcomes for African Americans in a Cardiovascular Prevention and Treatment Program. Advances in Mind-Body Medicine 34(1): 8-16	- Population not relevant to this review protocol
Blythe LaGasse, A. and Knight, A. (2011) Rhythm and music in rehabilitation: A critical review of current research. Critical Reviews in Physical and Rehabilitation Medicine 23(14): 49-67	- Review article but not a systematic review
Breitenfeld, T., Jergovi, K., Vargek Solter, V. et al. (2005) Music therapy in aphatic stroke patients - a pilot study. European journal of neurology 12(suppl2): 55p1060	- Conference abstract
Breitenfeld, T., Vargek Solter, V., Breitenfeld, D. et al. (2005) Is there a benefit for aphasic stroke patients treated with music therapy? - preliminary results. Cerebrovascular diseases (basel, switzerland) 19 (Suppl 2): 92-93	- Full text paper not available
Bunketorp Kall, L., Lundgren-Nilsson, A., Blomstrand, C. et al. (2012) The effects of a rhythm and music-based therapy program and therapeutic riding in late recovery phase following stroke: a study protocol for a three-armed randomized controlled trial. BMC Neurology 12: 141	- Study reported outcomes that were not included in the protocol
Bunketorp-Kall, L., Lundgren-Nilsson, A., Nilsson, M. et al. (2018) Multimodal rehabilitation in the late phase after stroke enhances the life situation of informal caregivers. Topics in Stroke Rehabilitation 25(3): 161-167	- Study reported outcomes that were not included in the protocol

Study	Code [Reason]
Bunketorp-Kall, L., Lundgren-Nilsson, A., Samuelsson, H. et al. (2017) Long-Term Improvements After Multimodal Rehabilitation in Late Phase After Stroke: A Randomized Controlled Trial. Stroke 48(7): 1916-1924	- Study reported outcomes that were not included in the protocol
Bunketorp-Kall, L., Pekna, M., Pekny, M. et al. (2019) Effects of horse-riding therapy and rhythm and music-based therapy on functional mobility in late phase after stroke. Neurorehabilitation 45(4): 483-492	- Study reported outcomes that were not included in the protocol
Cha, Y. J., Kim, J. D., Choi, Y. R. et al. (2018) Effects of gait training with auditory feedback on walking and balancing ability in adults after hemiplegic stroke: a preliminary, randomized, controlled study. International Journal of Rehabilitation Research 41(3): 239-243	- Study reported outcomes that were not included in the protocol
Cha, Y.; Kim, Y.; Chung, Y. (2014) Immediate effects of rhythmic auditory stimulation with tempo changes on gait in stroke patients. Journal of physical therapy science 26: 479-482	- Study reported outcomes that were not included in the protocol
Chen, F. J., Li, L., Sun, J. L. et al. (2015) The research into the functions of TCM five elements music therapy on anxious with anxiety due to stroke. Henan traditional chinese medicine [he nan zhong yi] 35(6): 1279-1280	- Study not reported in English
Choi, W.; Lee, G.; Lee, S. (2015) Effect of the cognitive-motor dual-task using auditory cue on balance of surviviors with chronic stroke: a pilot study. Clinical Rehabilitation 29(8): 763-70	- Study reported outcomes that were not included in the protocol
Chouhan, S. and Kumar, S. (2012) Comparing the effects of rhythmic auditory cueing and visual cueing in acute hemiparetic stroke. International journal of therapy and rehabilitation 19(6): 344-351	- Study reported outcomes that were not included in the protocol
Chouhan, S., Kumar, S., Walker, S. et al. (2012) Comparative study of the effects of rhythmic auditory cueing and visual cueing in acute hemiparetic stroke. International journal of therapy & rehabilitation 19(5): 1-8	- Duplicate reference
Cofrancesco, E. M. (1985) The effect of music therapy on hand grasp strength and functional	- Study design not relevant to this review protocol

Study	Code [Reason]
task performance in stroke patients. Journal of music therapy 22(3): 129-145	
Conklyn, D., Novak, E., Boissy, A. et al. (2012) The effects of modified melodic intonation therapy on nonfluent aphasia: a pilot study. Journal of Speech Language & Hearing Research 55(5): 1463-71	- Study reported outcomes that were not included in the protocol
Copland, D. and Roxbury, T. (2019) To examine whether daily music listening in addition to usual care will result in superior aphasia recovery compared to usual care only, as measured by standard clinical language and communication assessments at 2-4 weeks, 3 months and 6 months post stroke-onset.	- Study not reported in English
Crosby, LD, Wong, JS, Chen, JL et al. (2020) An Initial Investigation of the Responsiveness of Temporal Gait Asymmetry to Rhythmic Auditory Stimulation and the Relationship to Rhythm Ability Following Stroke. Frontiers in neurology 11	- Study design not relevant to this review protocol *Single arm trial*
Dispa, D.; Lejeune, T.; Thonnard, J. L. (2013) The effect of repetitive rhythmic precision grip task-oriented rehabilitation in chronic stroke patients: a pilot study. International Journal of Rehabilitation Research 36(1): 81-7	- Comparator in study does not match that specified in this review protocol
Do, A. (2016) To determine the therapeutic effect of the music glove and conventional hand exercises to subacute stroke patients.	- Full text paper not available
Douglass-Kirk, Pedro, Grierson, Mick, Ward, Nick S et al. (2022) Real-time auditory feedback may reduce abnormal movements in patients with chronic stroke. Disability and rehabilitation: 1-7	- Study reported outcomes that were not included in the protocol - Study does not contain an intervention relevant to this review protocol *Intervention lasted for 1 session only*
Elsner, B. (2018) Auditory stimulation for improving mobility after stroke.	- Full text paper not available
Elsner, B., Scholer, A., Kon, T. et al. (2020) Walking with rhythmic auditory stimulation in chronic patients after stroke: A pilot randomized	- Study reported outcomes that were not included in the protocol

Study	Code [Reason]
controlled trial. Physiotherapy Research International 25(1): e1800	
Fachner, J. C. (2014) Music Therapy for The Rehabilitation of Upper Limb With Stroke Patients (TIMPStro).	- Full text paper not available
Ford, M.; Wagenaar, R.; Newell, K. (2007) The effects of auditory rhythms and instruction on walking patterns in individuals post stroke. Gait & posture 26: 150-155	- Study design not relevant to this review protocol
Fotakopoulos, G. and Kotlia, P. (2018) The Value of Exercise Rehabilitation Program Accompanied by Experiential Music for Recovery of Cognitive and Motor Skills in Stroke Patients. Journal of Stroke & Cerebrovascular Diseases 27(11): 2932-2939	- Data not reported in an extractable format or a format that can be analysed *Reports outcomes for all groups combined*
Fouad, M. A. (2016) Effect of rhythmic auditory stimulation on gait in patients with stroke. International journal of medical and health sciences 3(6)	- Conference abstract
Friedman, N., Chan, V., Reinkensmeyer, A. N. et al. (2014) Retraining and assessing hand movement after stroke using the MusicGlove: comparison with conventional hand therapy and isometric grip training. Journal of Neuroengineering & Rehabilitation 11: 76	- Study reported outcomes that were not included in the protocol
Garcia-Casares, Natalia; Barros-Cano, Amanda; Garcia-Arnes, Juan A (2022) Melodic Intonation Therapy in Post-Stroke Non-Fluent Aphasia and Its Effects on Brain Plasticity. Journal of clinical medicine 11(12)	- Systematic review used as source of primary studies
Ghai, S. (2018) Effects of Real-Time (Sonification) and Rhythmic Auditory Stimuli on Recovering Arm Function Post Stroke: A Systematic Review and Meta-Analysis. Frontiers in neurology [electronic resource]. 9: 488	- Systematic review used as source of primary studies
Ghai, S. and Ghai, I. (2019) Effects of (music-based) rhythmic auditory cueing training on gait and posture post-stroke: A systematic review & dose-response meta-analysis. Scientific Reports 9(1): 2183	- Systematic review used as source of primary studies

Study	Code [Reason]
Goh, M. (2001) The role of music therapy in the rehabilitation of people who have had strokes, specifically focusing on depression. National research register. Issue 1	- Full text paper not available
Grau-Sanchez, J., Segura, E., Sanchez-Pinsach, D. et al. (2021) Enriched Music-supported Therapy for chronic stroke patients: a study protocol of a randomised controlled trial. BMC Neurology 21(1): 19	- Protocol only
Haire, C. (2017) Therapeutic instrumental music performance with sensory-enhanced motor imagery in chronic post-stroke rehabilitation.	- Comparator in study does not match that specified in this review protocol
Haire, Catherine M, Tremblay, Luc, Vuong, Veronica et al. (2021) Therapeutic Instrumental Music Training and Motor Imagery in Post-Stroke Upper-Extremity Rehabilitation: A Randomized-Controlled Pilot Study. Archives of rehabilitation research and clinical translation 3(4): 100162	- Comparator in study does not match that specified in this review protocol *Compares therapeutic instrumental music training with the same intervention with motor imagery in addition (with and without metronome cueing) therefore comparing different types of music therapy, which is not a comparison listed in the protocol.*
Hankinson, Katherine, Shaykevich, Alex, Vallence, Ann-Maree et al. (2022) A Tailored Music-Motor Therapy and Real-Time Biofeedback Mobile Phone App ('GotRhythm') to Promote Rehabilitation Following Stroke: A Pilot Study. Neuroscience insights 17: 26331055221100587	- Data not reported in an extractable format or a format that can be analysed *Outcomes reported as median and interquartile range values*
Haro-Martinez, A. M., Lubrini, G., Madero-Jarabo, R. et al. (2019) Melodic intonation therapy in post-stroke nonfluent aphasia: a randomized pilot trial. Clinical Rehabilitation 33(1): 44-53	- Study reported outcomes that were not included in the protocol
Haro-Martinez, Ana, Perez-Araujo, Carmen M, Sanchez-Caro, Juan M et al. (2021) Melodic Intonation Therapy for Post-stroke Non-fluent Aphasia: Systematic Review and Meta-Analysis. Frontiers in neurology 12: 700115	- Systematic review used as source of primary studies
Hewitt, L. and Sanctuary, C. (2015) Stroke sounds: music listening in stroke rehabilitation. International journal of stroke 10(suppl3): 64	- Conference abstract

Study	Code [Reason]
Huang, Wen-Hao, Dou, Zu-Lin, Jin, Hui-Min et al. (2021) The Effectiveness of Music Therapy on Hand Function in Patients With Stroke: A Systematic Review of Randomized Controlled Trials. Frontiers in neurology 12: 641023	- Systematic review used as source of primary studies
Jarvinen-Lepisto, P.; Burger, B.; Ala-Ruona, E. (2014) Motor performance in post-stroke recovery using active music therapy. 13th international conference for music perception and cognition / 5th conference of asia-pacific society	- Crossover trial (unit of randomisation = participant)
Jia, C., Zhang, H., Ni, G. et al. (2017) Spasmodic hemiplegia after stroke treated with scalp acupuncture, music therapy and rehabilitation: a randomized controlled trial. Zhongguo zhen jiu [Chinese acupuncture & moxibustion] 37(12): 1271-1275	- Study not reported in English
Jiang, Y., Yang, Y., Xiang, R. et al. (2015) Clinical study of post-stroke speech apraxia treated with scalp electric acupuncture under anatomic orientation and rehabilitation training. Zhongguo zhen jiu [Chinese acupuncture & moxibustion] 35(7): 661-664	- Study not reported in English
John, S.; Khanna, G. L.; Kotwal, P. (2010) Effect of music therapy and meditation along with conventional physiotherapy management in sub-acute stroke patients. British journal of sports medicine 44(suppl1): i14	- Conference abstract
Kang, T. W. (2015) Robot-assisted walking training for patients with subacute stroke: randomized controlled pilot trial of rhythmic arm swing versus arm fixation during training.	- Full text paper not available
Kang, T. W., Oh, D. W., Lee, J. H. et al. (2018) Effects of integrating rhythmic arm swing into robot-assisted walking in patients with subacute stroke: a randomized controlled pilot study. International Journal of Rehabilitation Research 41(1): 57-62	- Study does not contain an intervention relevant to this review protocol *Rhythmic arm swing without a music component built into the intervention*
Keller, I. and Lefin-Rank, G. (2010) Improvement of visual search after audiovisual exploration training in hemianopic patients. Neurorehabilitation and Neural Repair 24(7): 666-673	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Kim, J. H., Park, S. G., Lim, H. J. et al. (2012) Effects of the combination of rhythmic auditory stimulation and task-oriented training on functional recovery of subacute stroke patients. Journal of physical therapy science 24(12): 1307-1313	- Study reported outcomes that were not included in the protocol
Kim, J. S. and Oh, D. W. (2012) Home-based auditory stimulation training for gait rehabilitation of chronic stroke patients. Journal of physical therapy science 24: 775-777	- Study reported outcomes that were not included in the protocol
Kiper, P. (2017) Proprioceptive Stimulation With Manual Bilateral Rhythmic Exercise in Post-stroke Patients (BAT).	- Full text paper not available
Klinke, M. E., Hafsteinsdottir, T. B., Hjaltason, H. et al. (2015) Ward-based interventions for patients with hemispatial neglect in stroke rehabilitation: a systematic literature review. International Journal of Nursing Studies 52(8): 1375-403	- Study does not contain an intervention relevant to this review protocol
Kumari, N. (2017) Effects of rhythmic auditory cueing along with task oriented activities on upper limb functions in stroke patients.	- Full text paper not available
Le Danseur, M., Crow, A. D., Stutzman, S. E. et al. (2019) Music as a Therapy to Alleviate Anxiety During Inpatient Rehabilitation for Stroke. Rehabilitation Nursing Journal 44(1): 29-34	- Comparator in study does not match that specified in this review protocol
Lee, S. H.; Lee, K. J.; Song, C. H. (2012) Effects of rhythmic auditory stimulation (RAS) on gait ability and symmetry after stroke. Journal of physical therapy science 24(4): 311-314	- Study design not relevant to this review protocol
Lee, S.; Lee, K.; Song, C. (2018) Gait Training with Bilateral Rhythmic Auditory Stimulation in Stroke Patients: A Randomized Controlled Trial. Brain Sciences 8(9): 31	- Study reported outcomes that were not included in the protocol
Lin, S. I. (2007) Effect of rhythmic auditory cues on gait of stroke patients. Cerebrovascular diseases (basel, switzerland) 23(suppl2): 128	- Full text paper not available

Study	Code [Reason]
Magee, WI, Clark, I, Tamplin, J et al. (2017) Music interventions for acquired brain injury. Cochrane Database of Systematic Reviews	- Population not relevant to this review protocol
Mainka, S., Wissel, J., Voller, H. et al. (2018) The Use of Rhythmic Auditory Stimulation to Optimize Treadmill Training for Stroke Patients: A Randomized Controlled Trial. Frontiers in neurology [electronic resource]. 9: 755	- Study reported outcomes that were not included in the protocol
McCombe Waller, S.; Liu, W.; Whitall, J. (2008) Temporal and spatial control following bilateral versus unilateral training. Human Movement Science 27(5): 749-58	- Study reported outcomes that were not included in the protocol
McCue, P., Del Din, S., Hunter, H. et al. (2020) Auditory rhythmical cueing to improve gait and physical activity in community-dwelling stroke survivors (ACTIVATE): study protocol for a pilot randomised controlled trial. Pilot & Feasibility Studies 6: 68	- Protocol only
McIntosh, G. C., Rice, R. R., Prassas, S. G. et al. (1993) Rhythmic auditory-motor entrainment as gait rehabilitation technique with stroke patients. International congress on stroke rehabilitation: 43	- Duplicate reference
McIntosh, G. C., Thaut, M. H., Rice, R. R. et al. (1993) Auditory rhythmic cuing in gait rehabilitation with stroke patients. Canadian journal of neurological sciences 20(suppl4): 168	- Full text paper not available
Moon, S. Y. (2008) The effects of piano-playing music therapy on motor coordination of stroke patients using midi-based computer analysis. Neurorehabilitation and neural repair 22(5): 593	- Full text paper not available
Moumdjian, L., Sarkamo, T., Leone, C. et al. (2017) Effectiveness of music-based interventions on motricity or cognitive functioning in neurological populations: a systematic review. European journal of physical & rehabilitation medicine. 53(3): 466-482	- Population not relevant to this review protocol
Nikmaram, N., Scholz, D. S., Grosbach, M. et al. (2019) Musical Sonification of Arm Movements in Stroke Rehabilitation Yields Limited Benefits. Frontiers in Neuroscience 13: 1378	- Data not reported in an extractable format or a format that can be analysed

Study	Code [Reason]
Oiga, L. (2014) The effect of music and rhythmic auditory stimulation on upper motor strength rehabilitation of hemiparetic stroke patients in a tertiary hospital: a randomized controlled study. International journal of stroke 9suppl3: 237	- Conference abstract
Olson, D. M., Perera, A., Atem, F. et al. (2019) Music in mechanically ventilated stroke patients. British journal of neuroscience nursing 15: 8	- Comparator in study does not match that specified in this review protocol
Park, I. M., Oh, D. W., Kim, S. Y. et al. (2010) Clinical feasibility of integrating fast-tempo auditory stimulation with self-adopted walking training for improving walking function in post-stroke patients: a randomized, controlled pilot trial. Journal of physical therapy science 22: 295-300	- Study reported outcomes that were not included in the protocol
Park, M. O. and Lee, S. H. (2018) Effects of cognitive-motor dual-task training combined with auditory motor synchronization training on cognitive functioning in individuals with chronic stroke: A pilot randomized controlled trial. Medicine 97(22): e10910	- Study reported outcomes that were not included in the protocol
Prassas, S. G., Thaut, M. H., McIntosh, G. C. et al. (1997) Effect of auditory rhythmic cuing on gait kinematic parameters in hemiparetic stroke patients. Gait & posture 6: 218-223	- Study design not relevant to this review protocol
Purdie, H.; Hamilton, S.; Baldwin, S. (1997) Music therapy: facilitating behavioural and psychological change in people with stroke--a pilot study. International Journal of Rehabilitation Research 20(3): 325-7	- Data not reported in an extractable format or a format that can be analysed *Does not report the number of participants in each study arm and so unable to interpret results*
Raglio, A. (2017) Music therapy for rehabilitation in stroke patients (SONICHAND).	- Full text paper not available
Raglio, A., Attardo, L., Gontero, G. et al. (2015) Effects of music and music therapy on mood in neurological patients. World Journal of Psychiatry 5(1): 68-78	- Population not relevant to this review protocol
Raglio, A., Oasi, O., Gianotti, M. et al. (2016) Improvement of spontaneous language in stroke patients with chronic aphasia treated with music therapy: a randomized controlled trial.	- Data not reported in an extractable format or a format that can be analysed *Reports median and interquartile range values for outcomes only*

Study	Code [Reason]
International Journal of Neuroscience 126(3): 235-42	
Reagon, C., Gale, N., Enright, S. et al. (2016) A mixed-method systematic review to investigate the effect of group singing on health related quality of life. Complementary Therapies in Medicine 27: 1-11	- Population not relevant to this review protocol
Renna, L., Frkovic, N., Spear, M. et al. (2012) Stroke sounds: music listening in stroke rehabilitation. International journal of stroke 7(suppl1): 58	- Conference abstract
Richards, L. G., Senesac, C. R., Davis, S. B. et al. (2008) Bilateral arm training with rhythmic auditory cueing in chronic stroke: not always efficacious. Neurorehabilitation and neural repair 22: 180-184	- Study design not relevant to this review protocol
Rodriguez-Fornells, A. (2014) Music Therapy to Restore Motor Deficits After Stroke (NEUROMUSIC).	- Full text paper not available
Rosenberg, K. (2017) Multimodal Interventions Improve Stroke Recovery. American Journal of Nursing 117(10): 61	- Commentary only
Sarkamo, T. Leo T. Sihvonen A. Ripolles P. Rodrı and guez-Fornells, A. Tervaniemi M. (2016) Cognitive, emotional and neural benefits of music on stroke recovery. European stroke journal 1(suppl1): 730-731	- Conference abstract
Sarkamo, T., Pihko, E., Laitinen, S. et al. (2010) Music and speech listening enhance the recovery of early sensory processing after stroke. Journal of Cognitive Neuroscience 22(12): 2716-27	- Data not reported in an extractable format or a format that can be analysed
Sarkamo, T., Ripolles, P., Vepsalainen, H. et al. (2014) Structural changes induced by daily music listening in the recovering brain after middle cerebral artery stroke: a voxel-based morphometry study. Frontiers in Human Neuroscience 8: 245	- Study reported outcomes that were not included in the protocol
Sarkamo, T., Tervaniemi, M., Laitinen, S. et al. (2008) Music listening enhances cognitive	- Data not reported in an extractable format or a format that can be analysed

Study	Code [Reason]
recovery and mood after middle cerebral artery stroke. Brain 131(pt3): 866-76	*Reports as graph data only*
Schauer, M. and Mauritz, K. H. (2003) Musical motor feedback (MMF) in walking hemiparetic stroke patients: randomized trials of gait improvement. Clinical Rehabilitation 17(7): 713-22	- Study reported outcomes that were not included in the protocol
Schneider, S., Schonle, P. W., Altenmuller, E. et al. (2007) Using musical instruments to improve motor skill recovery following a stroke. Journal of Neurology 254(10): 1339-46	- Study reported outcomes that were not included in the protocol
Scholz, D. S., Rohde, S., Nikmaram, N. et al. (2016) Sonification of Arm Movements in Stroke Rehabilitation - A Novel Approach in Neurologic Music Therapy. Frontiers in neurology [electronic resource]. 7: 106	- Data not reported in an extractable format or a format that can be analysed
Shaw, Lisa, McCue, Patricia, Brown, Philip et al. (2022) Auditory rhythmical cueing to improve gait in community-dwelling stroke survivors (ACTIVATE): a pilot randomised controlled trial. Pilot and feasibility studies 8(1): 239	- Study reported outcomes that were not included in the protocol
Shen, J., Shen, X., Chang, G. F. et al. (1994) Effect of music electrotherapy on cerebral infarction. Chinese journal of physical therapy 17(3): 162-164	- Full text paper not available
Shen, J., Shen, X., Chang, G. et al. (1994) Effect of music electrotherapy treatment on cerebral infarction. Chinese journal of physical therapy 17(3): 162-164	- Full text paper not available
Shin, J. and Chung, Y. (2017) Influence of visual feedback and rhythmic auditory cue on walking of chronic stroke patient induced by treadmill walking in real-time basis. Neurorehabilitation 41(2): 445-452	- Study reported outcomes that were not included in the protocol
Shin, Jin and Chung, Yijung (2022) The effects of treadmill training with visual feedback and rhythmic auditory cue on gait and balance in chronic stroke patients: A randomized controlled trial. NeuroRehabilitation	- Study reported outcomes that were not included in the protocol

Study	Code [Reason]
Sihvonen, A. J., Leo, V., Ripolles, P. et al. (2020) Vocal music enhances memory and language recovery after stroke: pooled results from two RCTs. Annals of Clinical & Translational Neurology 7(11): 2272-2287	- Pooled analysis of a published and an unpublished trial with inappropriate methodology for this review
Silveira, T. M. (2018) Examining the effect of FES+iPad-based music therapy on upper limb function and wellbeing outcomes for stroke survivors.	- Full text paper not available
Soinila, S. (2012) Music Listening and Stroke Recovery (MUKU2).	- Full text paper not available
Stewart, C., Subbarayan, S., Paton, P. et al. (2019) Non-pharmacological interventions for the improvement of post-stroke quality of life amongst older stroke survivors: a systematic review of systematic reviews (The SENATOR ONTOP series). European Geriatric Medicine 10(3): 359-386	- Study design not relevant to this review protocol
Stinear, J. W. and Byblow, W. D. (2004) Rhythmic bilateral movement training modulates corticomotor excitability and enhances upper limb motricity poststroke: a pilot study. Journal of clinical neurophysiology 21(2): 124-131	- Study design not relevant to this review protocol
Street, A. J., Magee, W. L., Bateman, A. et al. (2018) Home-based neurologic music therapy for arm hemiparesis following stroke: results from a pilot, feasibility randomized controlled trial. Clinical Rehabilitation 32(1): 18-28	- Crossover trial (unit of randomisation = participant)
Street, A. J., Magee, W. L., Odell-Miller, H. et al. (2015) Home-based neurologic music therapy for upper limb rehabilitation with stroke patients at community rehabilitation stage-a feasibility study protocol. Frontiers in Human Neuroscience 9: 480	- Protocol only
Studebaker, S. (2007) The effect of a music therapy protocol on the attentional abilities of stroke patients. Unpublished masters thesis. University of kansas	- Full text paper not available
Suh, J. H., Han, S. J., Jeon, S. Y. et al. (2014) Effect of rhythmic auditory stimulation on gait and balance in hemiplegic stroke patients. Neurorehabilitation 34(1): 193-9	- Study reported outcomes that were not included in the protocol

Study	Code [Reason]
Sukumaran, S., Sivadasan, S., Sakunthala, P. T. et al. (2019) Effect of combined visual-auditory-sensory stimulation in hemineglect syndrome following right hemispheric ischemic strokes: a randomized control trial.	- Thesis paper - Study reported outcomes that were not included in the protocol
Syros, Apostolis; Kotlia, Polikceni; Fotakopoulos, George (2022) Preliminary findings from an acupuncture and experiential/traditional music therapy during the standard care of rehabilitation exercise program for recovery on post-stroke upper limb dysfunction. The International journal of neuroscience 132(11): 1110-1117	- Data not reported in an extractable format or a format that can be analysed *Does not report the mean and standard deviations for the relevant outcomes instead reporting alternative analyses that are not as relevant*
Thaut, M. H., Hoemberg, B., Hurt, C. P. et al. (1998) Rhythmic entrainment of paretic arm movements in stroke patients. Proceedings of the society for neuroscience 24: 1663	- Full text paper not available
Thaut, M. H., Hoemberg, V., Hurt, C. P. et al. (1998) Rhythmic entrainment of hemiparetic arm movements in stroke patients. Society for neuroscience abstracts 24: 1663	- Full text paper not available
Thaut, M. H., McIntosh, C. G., Rice, R. et al. (1993) Effect of rhythmic cuing on temporal stride parameters and EMG patterns in hemiparetic gait of stroke patients. Journal of neurological rehabilitation 7: 9-16	- Study design not relevant to this review protocol
Thaut, M. H.; McIntosh, G. C.; Rice, R. R. (1997) Rhythmic facilitation of gait training in hemiparetic stroke rehabilitation. Journal of the Neurological Sciences 151(2): 207-12	- Study reported outcomes that were not included in the protocol
Thaut, M. H., McIntosh, G. C., Rice, R. R. et al. (1995) Rhythmic auditory motor training in gait rehabilitation of stroke patients. Journal of stroke and cerebrovascular diseases 5(2): 100	- Full text paper not available
Tinga, A. M., Visser-Meily, J. M., van der Smagt, M. J. et al. (2016) Multisensory Stimulation to Improve Low- and Higher-Level Sensory Deficits after Stroke: A Systematic Review. Neuropsychology Review 26(1): 73-91	- Study does not contain an intervention relevant to this review protocol
Tong, Y., Forreider, B., Sun, X. et al. (2015) Music-supported therapy (MST) in improving	- Study reported outcomes that were not included in the protocol

Study	Code [Reason]
post-stroke patients' upper-limb motor function: a randomised controlled pilot study. Neurological Research 37(5): 434-40	
Van Criekinge, T., D'Aout, K., O'Brien, J. et al. (2019) The Influence of Sound-Based Interventions on Motor Behavior After Stroke: A Systematic Review. Frontiers in neurology [electronic resource]. 10: 1141	- Systematic review used as source of primary studies
Van Der Meulen, I., Van De Sandt-Koenderman, M. W., Heijenbrok, M. H. et al. (2016) Melodic Intonation Therapy in Chronic Aphasia: Evidence from a Pilot Randomized Controlled Trial. Frontiers in Human Neuroscience 10: 533	- Study reported outcomes that were not included in the protocol
van der Meulen, I., van de Sandt-Koenderman, W. M., Heijenbrok-Kal, M. H. et al. (2014) The Efficacy and Timing of Melodic Intonation Therapy in Subacute Aphasia. Neurorehabilitation & Neural Repair 28(6): 536-44	- Study reported outcomes that were not included in the protocol
van Vugt, F. T., Kafczyk, T., Kuhn, W. et al. (2016) The role of auditory feedback in music-supported stroke rehabilitation: A single-blinded randomised controlled intervention. Restorative Neurology & Neuroscience 34(2): 297-311	- Comparator in study does not match that specified in this review protocol
Volpi, J. J. (2018) Stroke recovery and music or no music.	- Study not reported in English
Wang, Y., Pan, W. Y., Li, F. et al. (2021) Effect of Rhythm of Music Therapy on Gait in Patients with Stroke. Journal of Stroke and Cerebrovascular Diseases 30 (3)	- Study reported outcomes that were not included in the protocol
Wheeler, B. L.; Shiflett, S. C.; Nayak, S. (2003) Effects of number of sessions and group or individual music therapy on the mood and behavior of people who have had strokes or traumatic brain injuries. Nordic journal of music therapy 12(2): 139-151	- Population not relevant to this review protocol *Less than 80% of participants had a stroke*
Whitall, J., McCombe Waller, S., Silver, K. H. et al. (2000) Repetitive bilateral arm training with rhythmic auditory cueing improves motor function in chronic hemiparetic stroke. Stroke; a journal of cerebral circulation 31(10): 2390-2395	- Study design not relevant to this review protocol

Study	Code [Reason]
Whitall, J., McCombe-Waller, S., Gordes, K. et al. (1999) Locomotor training with and without rhythmic auditory stimulation in patients with chronic stroke. Neurology report 23(5): 190	- Conference abstract
Wright, R. L., Brownless, S. B., Pratt, D. et al. (2017) Stepping to the Beat: Feasibility and Potential Efficacy of a Home-Based Auditory-Cued Step Training Program in Chronic Stroke. Frontiers in neurology [electronic resource]. 8: 412	- Comparator in study does not match that specified in this review protocol
Yakupov, E. Z., Nalbat, A. V., Semenova, M. V. et al. (2019) Efficacy of music therapy in the rehabilitation of stroke patients. Neuroscience and behavioral physiology 49(1): 121-128	- Study reported outcomes that were not included in the protocol
Yakupov, E. Z., Nalbat, A. V., Semenova, M. V. et al. (2017) Music therapy as an effective method of neurorehabilitation. Zhurnal nevrologii i psikhiatrii imeni S.S. Korsakova 117(5): 14-21	- Study not reported in English
Yoo, G. E. and Kim, S. J. (2016) Rhythmic Auditory Cueing in Motor Rehabilitation for Stroke Patients: Systematic Review and Meta-Analysis. Journal of Music Therapy 53(2): 149-77	- Systematic review used as source of primary studies
Yoon, S. K. and Kang, S. H. (2016) Effects of inclined treadmill walking training with rhythmic auditory stimulation on balance and gait in stroke patients. Journal of Physical Therapy Science 28(12): 3367-3370	- Study reported outcomes that were not included in the protocol
Young, Hui-Ju, Mehta, Tapan, Herman, Cassandra et al. (2021) The Effects of a Movement-to-Music (M2M) Intervention on Physical and Psychosocial Outcomes in People Poststroke: A Randomized Controlled Trial. Archives of rehabilitation research and clinical translation 3(4): 100160	- Study reported outcomes that were not included in the protocol
Zhang, J. and Chen, C. (2016) Effect of audio training on executive dysfunction in patients with stroke. Chinese journal of cerebrovascular diseases 13(7): 356-359	- Full text paper not available
Zhang, Xiaoying; Li, Jianjun; Du, Yi (2021) Melodic Intonation Therapy on Non-fluent Aphasia After Stroke: A Systematic Review and	- Systematic review used as source of primary studies

Study	Code [Reason]
Analysis on Clinical Trials. Frontiers in neuroscience 15: 753356	
Zhang, Y., Cai, J., Zhang, Y. et al. (2016) Improvement in Stroke-induced Motor Dysfunction by Music-supported Therapy: A Systematic Review and Meta-analysis. Scientific Reports 6: 38521	- Systematic review used as source of primary studies
Zhang, Y.; Yao, Y.; Lu, X. (2015) Therapeutic effect of music therapy and speech language therapy on post-stroke patients with non-fluent aphasia. Chinese journal of neurology 48(4): 274-278	- Study not reported in English
Zondervan, D. K., Friedman, N., Chang, E. et al. (2016) Home-based hand rehabilitation after chronic stroke: Randomized, controlled single-blind trial comparing the MusicGlove with a conventional exercise program. Journal of Rehabilitation Research & Development 53(4): 457-72	- Study reported outcomes that were not included in the 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 23: Studies excluded from the health economic review

Reference	Reason for exclusion
None	

Appendix K – Research recommendations – full details

K.1 Research recommendation

What is the clinical and cost-effectiveness of music therapy for people after a first stroke or recurrent strokes?

K.1.1 Why this is important

Music therapy is an evidence based clinical intervention, delivered by trained music therapists with the aim to help people achieve their therapeutic goals. It is becoming increasingly used to help people after a stroke to support people's emotional, cognitive, physical and communication needs. This review identified studies that in general reported positive outcomes of music interventions. However, the majority of the evidence was for music interventions not delivered by trained music therapists. Furthermore, the evidence base was limited due to small sample sizes and a lack of cost effectiveness data. Therefore, it was not possible to make a recommendation for use in the NHS at this time. High quality randomised controlled trials, with a larger number of participants that include cost effectiveness data and compare music therapy with a time matched appropriate comparator are needed. Research should also include outcomes important to people who have had a stroke such as stroke-specific Patient-reported Outcome Measures and activities of daily living to fully explore the possible benefits of this therapy. The committee highlighted that additional therapies may be present that incorporate sound and could therefore be beneficial for people after stroke (for example: sound therapy). While this was not investigated during this guideline update, this was highlighted as a potential area that could benefit from further investigation.

K.1.2 Rationale for research recommendation

Importance to 'patients' or the population	Music therapy is becoming increasingly popular amongst stroke survivors. Lay members of the committee shared their own personal experiences of music therapy and stated that it significantly improved both their quality of life and that of their family members. It is currently not widely used in an NHS setting and therefore further research is important to be able to recommend it use in the NHS.
Relevance to NICE guidance	There is a growing body of evidence into the use of music therapy for a variety of conditions covered by NICE guidance. This review showed benefits of music therapy for a number of reported outcome measures included health-related quality of life and psychological distress. However, due to the limited evidence base it was not possible to make a recommendation at this stage. Further evidence would help to answer the original review question and to inform future guidance.
Relevance to the NHS	Music therapy is an emerging intervention with a growing evidence base. It may be an effective therapy for a wide range of conditions so has the scope to help a large number of patients. Currently the evidence base is too small to be

	able make a positive recommendation for its use. As music therapy is not widely used in the NHS there would likely be a large resource impact so further robust randomised controlled trials with cost effectiveness data are required.
National priorities	None identified.
Current evidence base	This review identified studies relating to different types of music interventions which included a number of benefits including health-related quality of life and psychological distress. However, the evidence base was limited due to small sample sizes, lack of cost effectiveness data and no time matched comparator therapy. Large, high-quality randomised controlled trials that include cost effectiveness data and compare music therapy with a time matched social activity as a comparator are therefore required. The committee highlighted that additional therapies may be present that incorporate sound and could therefore be beneficial for people after stroke (for example: sound therapy). While this was not investigated during this guideline update, this was highlighted as a potential area that could benefit from further investigation.
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.12 Modified PICO table

Population	Inclusion: • Adults (age ≥16 years) who have had a first stroke or recurrent stroke (including people after a subarachnoid haemorrhage) Exclusion: • Children (age <16 years) • People who have had a transient ischaemic attack
Intervention	• Music therapy delivered by trained music therapists (Music therapy can include any type of music therapy or sound based therapy deemed appropriate by the therapist)

Comparator	• Time matched intervention of equivalent interaction with a healthcare professional that does not involve music • No additional treatment (usual care comparison)
Outcome	At time period • <6 months • ≥6 months • Person/participant generic health-related quality of life • Carer generic health-related quality of life • Activities of daily living • Psychological distress • Stroke-specific Patient-Reported Outcome Measures • Wellbeing scores • Participation in leisure activities/social groups scores • Withdrawal due to adverse events
Study design	Randomised controlled trial
Timeframe	6 months
Additional information	Subgroup analyses: • Severity of stroke (NIHSS: mild, moderate, severe, very severe) • Time after stroke at the start of the trial (hyperacute, acute, subacute, chronic)