National Institute for Health and Care Excellence

Final

Stroke rehabilitation in adults (update)

[L] Evidence reviews for circuit training for walking

NICE guideline NG236

Evidence reviews underpinning recommendation 1.13.23 in the NICE guideline

October 2023

Final

These evidence reviews were developed by NICE

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1.1 Review question

In people after stroke, what is the clinical and cost effectiveness of group training to improve walking?

1.1.1 Introduction

Physical activity after stroke is known to improve functional recovery and is also a factor in prevention of recurrent stroke. Group based training with focus on mobility provides increased opportunity to be more physically active, may lead to improvements in walking ability and has possible added benefits of providing peer support and increased motivation to engage in walking activities. Group based training has potential to reduce staffing resource needed to deliver programmes to support people to improve their walking depending on the setting in which it is delivered.

Group based activities are currently delivered in acute, inpatient and community settings, both within NHS and voluntary organisations but provision is variable depending on location and service availability. There is not currently any guidance regarding the method of delivering rehabilitation for walking or the setting that group training might be delivered. Recent studies suggest that group training may be effective to improve walking after stroke and further review is required to demonstrate both effectiveness and cost effectiveness of delivering group training to improve walking.

1.1.2 Summary of the protocol

Table 1: PICO characteristics of review question

Population	Inclusion: • Adults (age ≥16 years) who have had a first or recurrent stroke (including people after subarachnoid haemorrhage). Exclusion: • Children (age <16 years) • People who had a transient ischaemic attack
Intervention	• Circuit class training ○ Definition: An intervention that involves participants receiving physical rehabilitation involving repetitive (within session) practice of functional tasks arranged in a circuit with the aim of improving mobility. This is completed in a group environment, with a staff-to-client ratio of no greater than 1:3 (that is, no more than one staff member per three clients). ○ Providing a minimum of once weekly sessions for a minimum of four weeks • Circuit class therapy with education
Comparison	• Other types of circuit class training • Any other intervention, including: ○ Active interventions aiming at improving mobility/usual care (including individual therapy) • No treatment
Outcomes	All outcomes are considered equally important for decision making and therefore have all been rated as critical:

	At time period:
	• Post-intervention
	• Follow-up (wherever available, for example: 3-6 months post-intervention)
	
	• 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])
	• 6-minute walk test (continuous outcomes will be prioritised)
	• Walking speed (continuous outcomes will be prioritised)
	• Functional mobility measures
	  o Timed Up and Go (continuous outcomes will be prioritised)
	  o Rivermead Mobility Index (continuous outcomes will be prioritised)
	• Measures of standing balance
	• Measures of motor impairment
	  o Lower limb strength (continuous outcomes will be prioritised)
	  o Range of motion (continuous outcomes will be prioritised)
	• Activities of daily living (continuous outcomes will be prioritised)
	• Stroke-specific Patient-Reported Outcome Measures (continuous outcomes will be prioritised)
	• Length of hospital stay (continuous outcomes will be prioritised)
	• Adverse events (dichotomous outcome)

Study design	• Systematic reviews of RCTs • Parallel RCTs If insufficient RCT evidence is available, non-randomised studies will be considered, including: 1. Prospective and retrospective cohort studies 2. Case control studies (if no other evidence identified)

For full details see the review protocol in Appendix A.

1.1.3 Methods and process

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

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

1.1.4 Effectiveness evidence

1.1.4.1 Included studies

One systematic review[10] and in total twenty seven randomised controlled trial studies (thirty four papers) were included in the review[2-13, 15-24, 26-37] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary (section 1.1.6 Summary of the effectiveness evidence).

This review updated a published Cochrane review, English 2017[10]. This review included seventeen randomised controlled trials with a search conducted up to January 2017. In this evidence review, an additional eleven randomised controlled trial studies were identified and added to the review[2, 4, 8, 15, 16, 18, 21, 22, 29, 30, 34]. This included one cross-over trial[20]. The protocol for this review originally specified that cross-over trials would be excluded. However, this study was ultimately included to maintain consistency with the Cochrane review, which stated that the first phase of cross-over trials could be considered for inclusion.

The evidence from the randomised controlled trial studies investigated the follow comparisons:

Circuit class training compared to:

- Any other intervention (19 studies)
- Other types of circuit class training (2 studies)
- No treatment (1 study)

Circuit class training with education compared to:

- Any other intervention (2 studies)
- Circuit class training (without education) (1 study)

Circuit class training interventions generally focused on repetitive (within session) practice of functional tasks arranged in a circuit, with the aim of improving mobility. Studies of interventions that included exercises solely aimed at improving impairment (such as strengthening, range of motion or cardiovascular fitness) were excluded as per the Cochrane review protocol. The comparator interventions varied between the studies and included a mix of the following: the same exercise as the circuit class but delivered individually rather than in a group; group classes but for upper limb training or stretching only; education only; Bobath therapy; usual care only or waiting list control.

Circuit class training was generally offered alongside usual care and in some cases in conjunction with a home-based programme that was given as homework. In the majority of studies the intervention and control group treatments were matched for treatment time. However, in some studies the control group were only provided with usual care or were not provided with matched treatment time[9, 11, 13, 15, 17, 24, 32, 34].

In general circuit class training was delivered for approximately 30 minute – 3 hours per day and sessions ranged from once per fortnight to 7 days per week. The duration of the interventions ranged from 2 weeks to 40 weeks. Most commonly, circuit classes took place 3 times per week for six weeks and were approximately 60 minute sessions. The staff participant ratio varied between studies and ranged from 1:3 – 1:6. In the majority of studies the intervention was delivered by a physiotherapist.

Four studies[4, 11, 13, 34] reported circuit class training with education. These involved approximately 20 minutes to 1 hour of education usually prior to the circuit class training and included the following topics: falls risk, health education, interactive self-management education, discussions around physical activity and goal setting.

The majority of studies included people in the chronic phase post stroke and most commonly interventions were delivered in an outpatient setting. The baseline stroke severity and premorbid Modified Rankin status of the participants was not reported in most studies.

Indirectness

14 outcomes were downgraded for indirectness due to intervention or outcome indirectness. In most cases this was due to the studies not stating the staff: participant ratio for the circuit classes. The protocol, adapted from the included Cochrane review[10], only included studies with a staff participant ratio of 1:3. Any studies which did not explicitly state the ratio or had a greater staff ratio were downgraded for intervention indirectness. One study [34] reported withdrawal due to adverse events rather than all adverse events and so outcomes including this data were downgraded for outcome indirectness. One study was downgraded as it

compared circuit class training with education to the same circuit class training with mental imagery instead[4].

Inconsistency

Several outcomes showed heterogeneity and was not resolved by sensitivity or subgroup analyses. Therefore, the outcomes were downgraded for inconsistency and analysed using a random effects model.

See also the study selection flow chart in Appendix C, study evidence tables in Appendix D, forest plots in **Error! Reference source not found.** and GRADE tables in Appendix F.

1.1.4.2 Excluded studies

See the excluded studies list in Appendix J.

1.1.5 Summary of studies included in the effectiveness evidence

Table 2: Summary of studies included in the evidence review

Study	Intervention and comparison	Population	Outcomes	Comments
Ali 2020[2]	**Circuit class training** (n=11) Circuit training program comprised of five stations including Sit to Stand training, Step up forward, backwards and sideways, trunk control and rotation, reaching out in various directions collecting an object and passing on other side. Five minutes per station. Treatment was 3 sessions of 50 minutes each for six weeks. **Any other intervention** (n=11) The same program but completed as an individual with 1:1 supervision. **Concomitant therapy:** Not reported.	**People after a first or recurrent stroke** Mean age: 60.81 years N = 22 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Walking speed at post-intervention Measures of standing balance at post-intervention	Setting: Outpatient follow up in Pakistan. Sources of funding: Not reported.

Study	Intervention and comparison	Population	Outcomes	Comments
Blennerhassett 2004[3]	**Circuit class training** (n=15) Mobility-related CCT, 10 5-minute workstations consisting of functional tasks including sit to stand, step ups, obstacle course walking, standing balance, stretching and strengthening exercises); 1 h/day, 5 days/week for 4 weeks. Staff:participant ratio: 1:4. **Any other intervention** (n=15) Upper limb-related CCT, 10 5-minute workstations consisting of functional tasks to improve reach to grasp, hand eye co-ordination, stretching and strengthening exercises; 1 h/day, 5 days/week for 4 weeks. Staff:participant ratio: 1:4. **Concomitant therapy:** Both groups received additional CCT therapy in addition to usual care	**People after a first or recurrent stroke** Mean age (SD): 55.1 (15.9) years N = 30 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Functional mobility measures at post-intervention and follow up Length of hospital stay at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]
Bovonsunthonchai 2020[4]	**Circuit class training with education** (n=20) 25 minutes of health education preceded by 65 minutes of structured program circuit class training. The circuit training program involved 7 different	**People after a first or recurrent stroke** Mean age (SD): 52.7 (11.5) years N = 40 Mean time after stroke:	Walking speed at post-intervention	Setting: Outpatient follow up in three centres: the Physical Medicine and Rehabilitation Department, North Okkalapa General Hospital, East General Hospital

Study	Intervention and comparison	Population	Outcomes	Comments
	workstations and took place 3 times a week for 4 weeks. **Other type of circuit class training with mental imagery** (n=20) 25 minutes of mental imagery preceded by 65 minutes of structured program circuit class training. Groups practiced 3 times a week for 4 weeks. The same circuit class training was provided, with mental imagery being practiced in four phases. **Concomitant therapy:** No additional information.	Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Mild (or NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear		and National Rehabilitation Hospital, Yangon, Myanmar in Thailand. Sources of funding: This study was funded by the Norway Scholarship (Mahidol-Norway Capacity Building Initiative for ASEAN) and Faculty of Physical Therapy, Mahidol University.
Dean 2000[5]	**Circuit class training** (n=6) Mobility-related CCT, 10 workstations functional tasks including seated reaching beyond arms' reach, sit to stand, stepping activities, heel lifts, standing balance, strengthening exercises, walking activities; 1 h, 3 times/week for 4 weeks. Staff:participant ratio: 1:6 **Any other intervention** (n=6) Upper limb-related CCT, workstations consisting of upper limb tasks; 1 h, 3 times/week for 4	**People after a first or recurrent stroke** Mean age (SD): 64.3 (7.4) years N = 12 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Functional mobility measures at post-intervention and follow up Measures of standing balance at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	weeks. Staff:participant ratio: 1:6. **Concomitant therapy:** No additional information.			
Dean 2012[7] Subsidiary study: Dean 2009[6]	**Circuit class training** (n=76) Mobility-related CCT, task-related training with progressive balance, strengthening, standing, walking and stair climbing exercises, home programme and advice to increase walking. Delivered weekly 40 weeks. Staff:participant ratio: not reported **Any other intervention** (n=75) Upper-limb related CCT, task-related strength and co-ordination training, cognitive training, home programme and advice to increase use of upper limb and engage in more cognitive tasks. Staff:participant ratio: not reported **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Mean age (SD): 67.1 (12.4) years N = 151 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Person/participant generic health-related quality of life at post-intervention Six minute walk test at post-intervention Walking speed at post-intervention Functional mobility measures at post-intervention Measures of standing balance at post-intervention Measures of motor impairment at post-intervention Adverse events at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]
Dean 2018[8]	**Circuit class training** (n=23) Circuit class training delivered in a community setting (one gym, two church halls and	**People after a first or recurrent stroke** Mean age (SD): 70.5 (11.1) years N = 45	Person/participant generic health-related quality of life at post-intervention and follow up Functional mobility measures	Setting: Community based in the United Kingdom. Sources of funding: Funded by the Stroke

Study	Intervention and comparison	Population	Outcomes	Comments
	one community centre) with twice-weekly 2-hour sessions over 3 months, comprising: an introductory one-to-one session (home visit); 10 twice-weekly group classes with up to 2 trainers and 8 clients (training venue); a closing one-to-one session (home visit); followed by 3 (one per month) drop-in sessions. Participants completed home-based training throughout. Staff:participant ratio: 1:4 **Any other intervention** (n=22) Treatment as usual. This ranged from zero treatment to engagement with any health service(s). All participants were asked to not participate in additional physical rehabilitation (either NHS or private). All people received an advice booklet about exercise. **Concomitant therapy:** No additional information.	Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Mixed (majority 3)	at post-intervention and follow up Stroke-specific Patient-Reported Outcome Measures at post-intervention and follow up Adverse events at post-intervention and follow up	Association and the Peninsula Patient Involvement Group with the ReTrain Stroke Service User Group. The NIHR Collaboration for Leadership in Applied Health Research and Care South West Peninsula at the Royal Devon and Exeter NHS Foundation Trust also supported this work.
English 2015[9] Subsidiary study: Hillier 2011[12]	**Circuit class training** (n=93) Circuit class therapy for up to 3 hours per day, usually in two 90 minute sessions morning and afternoon 5 days a week for 4 weeks. Therapists were	**People after a first or recurrent stroke** Mean age (SD): 70.1 (12.9) years N = 283	Person/participant generic health-related quality of life at post-intervention Six minute walk test at post-intervention Walking speed at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	encouraged to prescribe exercises and activities that were task-specific, included part- as well as whole-practice of tasks, with an emphasis on repetition and feedback Staff:participant ratio: between 1:3 and 1:6. **Any other intervention** (n=190) A combination of two groups. One (n=96) received usual care provided 7 days a week on both Saturday and Sunday for the duration of their inpatient stay, in addition to their usual 5 days therapy. The other (n=94) received usual care dependent on the site provided for 5 days a week. This was done with daily individual therapy and augmented for some people by group physiotherapy 1-4 times a week. **Concomitant therapy:** No additional information.	Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Activities of daily living at post-intervention Stroke-specific patient-report outcome measures post-intervention Length of hospital stay at post-intervention Adverse events at post-intervention	
Harrington 2010[11]	**Circuit class training with education** (n=119) CCT with exercises adapted to ability aimed at improving balance, strength and endurance, plus home exercise programme, plus interactive self-	**People after a first or recurrent stroke** Mean age (SD): 70.5 (10.4) years N = 243 Mean time after stroke:	Functional mobility measures at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	management education sessions; 1 h exercise and 1 h of education twice a week for 8 weeks. Duration and frequency: not reported. Staff:participant ratio: 2:9 **Any other intervention** (n=124) Standard care and information sheet with list of local exercise classes. Duration and frequency: not reported. **Concomitant therapy:** No additional information.	Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear		
Holmgren 2010[13]	**Circuit class training with education** (n=15) Mobility-related circuit-class therapy, focus on physical activity and functional performance and education about falls risk. Circuit class therapy duration not specified, 7 sessions a week for 5 weeks; education 1 h/week for 5 weeks. Staff:participant ratio: not reported. **Any other intervention (education only)** (n=19) Education about coping with hidden dysfunctions after stroke 1 h/week for 5 weeks.	**People after a first or recurrent stroke** Mean age (SD): 78.5 (7.6) years N = 34 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: >2	Person/participant generic health-related quality of life at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy: No additional information.			
Kang 2021[15]	**Circuit class training** (n=30) A multicomponent exercise program performed for 60 minutes per session, three times a week for 8 weeks. Two groups high speed (n =15) and low speed (n=15) velocity strength training were combined in a circuit. Aerobic and resistance exercises were performed. Staff:participant ratio: not reported. **Any other intervention** (n=15) Whole-body static stretching performed for 1 hour per class, twice a week for 8 weeks. **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Mean age (SD): 54.8 (3.4) years N = 45 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Functional mobility measures at post-intervention Measures of standing balance at post-intervention Measures of motor impairment at post-intervention	Setting: People admitted to the sports center of N Hospital in Seoul, Republic of Korea. Sources of funding: This research was funded by a grant (#15-C-01) from the Korea National Rehabilitation Research Institute, Seoul, Republic of Korea.
Kim 2016[17]	**Circuit class training** (n=10) Mobility-related CCT, including trunk exercises, active sitting practice, sit-to-stand practice, standing and walking practice, aerobic exercise and strength training; 90 min/per day, 5 days/ week for 4 weeks	**People after a first or recurrent stroke** Mean age (SD): 65.6 (6.2) years N = 20 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear	Six minute walk test at post-intervention Measure of standing balance at post-intervention Functional mobility measures at post-intervention Activities of daily living at post-intervention Adverse events at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	Staff:participant ratio: at least 2 participants to 1 therapist **Any other intervention** (n=10) Usual care physiotherapy provided in 2 x 30-min sessions, 5 x per week for 4 weeks. Content based on neurodevelopmental approach and provided in one-to-one therapy sessions **Concomitant therapy:** No additional information.	Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear		
Kim 2017[16]	**Circuit class training** (n=15) Task-oriented circuit training at the rehabilitation centre, for a total of 50 minutes, five times a week, for 4 weeks for a total of 20 sessions. It consisted of task-oriented activities for improving balance, walking competence, and respiration ability. Staff:participant ratio: 2:3 **Any other intervention** (n=15) Exercise focused on task-oriented exercise, such as strengthening exercise (resistance exercise), standing balance (using varying methods)	**People after a first or recurrent stroke** Mean age (SD): 55.7 (12.2) years N = 30 Mean time after stroke: Subacute 7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention Function mobility measures post-intervention Measures of standing balance at post-intervention	Setting: Inpatients in the rehabilitation centres from South Korea. Sources of funding: No additional information.

Study	Intervention and comparison	Population	Outcomes	Comments
	and functional activities for gait improvement. **Concomitant therapy:** Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.			
Knox 2018[18]	**Circuit class training** (n=51) Task orientated gait training. The participants attended six 1-hour sessions over this 12-week period with their caregiver. It consisted of a series of six exercises and focused on improving strength, balance, and task performance while standing and walking, and included an endurance walking station. Staff:participant ratio: 1:4-6 **Any other intervention** (n=93) Two groups combined for the review. Strength intervention (n=45) delivered by a physiotherapist, and included 10 exercises targeting	**People after a first or recurrent stroke** Mean age (SD): 50.0 (13.9) years N = 144 Mean time after stroke: Subacute 7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Functional mobility measures at post-intervention and follow up Measures of standing balance at post-intervention and follow up	Setting: Outpatients physiotherapy department in South Africa. Sources of funding: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Financial support was obtained from the Medical Research Council of South Africa and the Fonds de recherche du Québec-Santé (FRQS).

Study	Intervention and comparison	Population	Outcomes	Comments
	the major muscles in the lower extremities. Each exercise consisted of 3 x 10 repetitions and progressed as per the participants' performance. Participants in the Control group (n=48) attended a 90-minute educational session on stroke management that included 20 minutes of exercises **Concomitant therapy:** Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.			
Martins 2020[22] Subsidiary study: Martins 2017[21]	**Circuit class training** (n=18) Task-specific circuit training divided into 30 minutes of tasks for the upper limb and 30 minutes for the lower limb. The tasks were organised in a circuit with 11-stations. The participants performed five minutes of exercises in each station, except for the gait training with auditory cue, which lasted 10 minutes. Staff:participant ratio: 1:2-6	**People after a first or recurrent stroke** Mean age (SD): 55.5 (15.1) years N = 36 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Stroke-specific Patient-Reported Outcome Measures at post-intervention and follow up Adverse events at post-intervention and follow up	Setting: Outpatient follow up in Canada. Sources of funding: This study was funded by the following research funding agencies: Coordenacao de Aperfeicoamento de Pessoal Ensino Superior (CAPES - Financial Code 001), Conselho Nacional de Desenvolvimento Cientifico e Tecnologico, Fundacao de

Study	Intervention and comparison	Population	Outcomes	Comments
	Any other intervention (n=18) Stretching and memory exercise and health education, 3 times a week, 60 minute sessions over 12 weeks. The control group intervention consisted of 40 minutes of static global stretching and 20 minutes of memory exercises, and/or health education sessions. Health education sessions included information on risk factors for stroke, the importance of correct consumption of medications and fluid intake, frequency of medical consultations, and quality of sleep. **Concomitant therapy:** All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totalling 36 sessions.			Amparo a Pesquisa de Minas Gerias (FAPEMIG), and Pro-reitoria de Pesquisa da Universidade Federal de Minas Gerais (PRPq/UFMG).
Moore 2015[23]	**Circuit class training** (n=20) Mobility CCT based on FAME programme including warm-up, stretching, functional strengthening, balance, agility & fitness, cool down; 45-60 minutes, 3 times/week for 19 weeks.	**People after a first or recurrent stroke** Mean age (SD): 69 (9.7) years N = 40 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear	Six minute walk test at post-intervention Walking speed at post-intervention Measures of standing balance at post-intervention Adverse events at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	Any other intervention (n=20) Home stretching programme of matched duration; 45 to 60 minutes. 3 times/week for 19 weeks. **Concomitant therapy:** No additional information.	Severity: Mild (NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear		
Mudge 2009[24]	**Circuit class training** (n=31) Mobility circuit class training. 15 x 2-minute workstations including walking, standing balance and strengthening. 50-60 minutes for 3 times/week for 4 weeks. **Any other intervention (social and education classes only)** (n=27) 4 social and 4 educational sessions; duration not specified, twice a week for 4 weeks. **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Median age (range): Intervention: 76.0 (39.0–89.0) Control: 71.0 (44.0–86.0) years N = 58 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Measures of standing balance at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]
Outermans 2010[26]	**Circuit class training (high intensity)** (n=22) High-intensity mobility CCT, workstations based on Dean 2000 with progressive target heart rate; 45-60 minutes, 3 times/week for 4 weeks in addition to	**People after a first or recurrent stroke** Mean age (SD): 56.6 (8.6) years N = 43 Mean time after stroke: Subacute (7	Six minute walk test at post-intervention Walking speed at post-intervention Measures of standing balance at post-intervention Adverse events at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	30 min/day usual care physiotherapy. Staff:participant ratio: not reported **Other circuit class training (low intensity)** (n=21) Low-intensity mobility CCT, based on motor control and balance, no progression of heart rate; 45-60 minutes, 3 times/week for 4 weeks in addition to 30 min/day usual care physiotherapy. **Concomitant therapy:** No additional information.	days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear		
Pang 2005[27] Subsidiary study: Pang 2006[28]	**Circuit class training** (n=32) Mobility-related circuit class training based on FAME programme including warm-up, stretching, functional strengthening, balance, agility & fitness, cool down including target heart rate; 1-h session, 3 times/ week for 19 weeks Staff:participant ratio: 3:9-12 **Any other intervention** (n=31) Upper-limb-related exercise training including strengthening, range of motion, functional reach and manipulation tasks; 1-h session, 3	**People after a first or recurrent stroke** Mean age (SD): 65.3 (8.8) years N = 63 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention Measures of standing balance at post-intervention Measures of motor impairment at post-intervention Adverse events at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	times/week for 19 weeks. **Concomitant therapy:** No additional information.			
Qurat 2018[29] Subsidiary study: Qurat 2018[30]	**Circuit class training (task specific circuit gait training)** (n=18) Eight work stations of different activities related to balance and gait were defined at each work stations. Patient practiced each task on station for 4-5 minutes. Total time for the session was 40-50 minutes and continued four days a week over a period of six weeks. All work stations were supervised by therapist. Staff:participant ratio: not reported **Any other intervention** (n=18) Traditional gait training exercises were given to the control group for four days a week with session duration 40-50 minutes. This treatment was continued for a period of six weeks. **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Mean age (SD): 54.1 (10.1) years N = 36 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: >2	Functional mobility measures at post-intervention Measures of standing balance at post-intervention	Setting: Outpatient follow up in Pakistan. Sources of funding: No funding.
Song 2015[32] Subsidiary study: Song 2015[31]	**Circuit class training** (n=11)	**People after a first or recurrent stroke**	Walking speed at post-intervention	*This study was included in the original Cochrane review that was updated

Study	Intervention and comparison	Population	Outcomes	Comments
	Mobility CCT, provided in circuit. 30 min/day, 3 times/week for 4 weeks. Inpatient rehabilitation. Staff:participant ratio: not reported **Any other intervention** (n=19) 1 group (n=10) receiving mobility exercises, provided one-to-one. 1 group (n=9) receiving conventional therapy (not described). **Concomitant therapy:** No additional information.	Mean age (SD): 62.2 (8.6) years N = 30 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear		in this review. For further details see English 2017[10]
Tang 2014[33]	**Circuit class training** (n=25) Mobility circuit class training. Aerobic training with target progressive heart rate using brisk walking, cycling, step ups, sit to stands. 60-min sessions 3 times/week for 6 months. Staff:participant ratio: 3:12. **Any other intervention** (n=19) Balance and flexibility non-aerobic, including balance exercise progressed to be challenging. 60-min sessions 3 times/week for 6 months. **Concomitant therapy:** No	**People after a first or recurrent stroke** Mean age (SD): 66.3 (7.1) years N = 50 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Mild (NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention Adverse events at post-intervention	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	additional information.			
Vahlberg 2017[34]	**Circuit class training with education** (n=34) Circuit class training conducted twice weekly over a 3 month period. Included: a warm-up (10 minutes), a circuit class (approximately 45 minutes) and a motivational session that included discussions about issues and personal goals that are related to physical activity (20 minutes). **Any other intervention** (n=33) Continue with regular activities. Were not restricted from participating in ordinary physical activities and rehabilitation programs. **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Mean age (SD): 73.1 (5.4) years N = 67 Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear	Person/participant generic health-related quality of life at post-intervention and follow up Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Functional mobility measures at post-intervention and follow up Measures of standing balance at post-intervention and follow up Adverse events at post-intervention and follow up	Setting: Outpatient follow up in Sweden. Sources of funding: Supported by grants from the Medical Faculty at Uppsala University STROKE-Riksfőrbundet and the Uppsala County Council and municipality in Sweden.
Van de Port 2012[36] Subsidiary study: Van de Port 2009[35]	**Circuit class training** (n=126) Mobility circuit class training. Aerobic training with target progressive heart rate using brisk walking, cycling, step ups, sit to stands. 60-min sessions 3 times/week for 6 months. Staff:participant ratio: 3:12.	**People after a first or recurrent stroke** Mean age (SD): 57.0 (10.1) years N = 250 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Functional mobility measures at post-intervention and follow up Measures of standing balance at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

Study	Intervention and comparison	Population	Outcomes	Comments
	Any other intervention (n=124) Balance and flexibility non-aerobic, including balance exercise progressed to be challenging. 60-min sessions 3 times/week for 6 months. **Concomitant therapy:** No additional information.	Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear		
Verma 2011[37]	**Circuit class training** (n=15) Workstations including balance, stair walking, turning, transfers, and speed walking plus mental imagery. 40-min sessions, 7 days/week for 2 weeks. Staff:participant ratio: 1:4 **Any other intervention** (n=15) Conventional lower limb therapy based on Bobath techniques. 40-min sessions, 7 days/week for 2 weeks. **Concomitant therapy:** No additional information.	**People after a first or recurrent stroke** Mean age (SD): 54.2 (7.8) years N = 30 Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Mild (NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear	Six minute walk test at post-intervention and follow up Walking speed at post-intervention and follow up Functional mobility measures at post-intervention and follow up Activities of daily living balance at post-intervention and follow up Adverse events at post-intervention and follow up	*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017[10]

See Appendix D for full evidence tables.

1.1.6 Summary of the effectiveness evidence

Table 3: Clinical evidence summary: Circuit class therapy compared to any other intervention

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
Person/participant health related quality of life (SF-12 PCS, 0-100, higher values are better, change score) at end of intervention	133 (1 RCT) follow-up: mean 12 months	⊕◯◯◯ Very low[a,b,c]	-	The mean person/participant generic health-related quality of life at post-intervention was 2	MD **2 lower** (5.06 lower to 1.06 higher)	MID = 2 (SF-12 established MID)
Person/participant generic health-related quality of life (SF-12 MCS, 0-100, higher values are better, change score) at post-intervention	133 (1 RCT) follow-up: mean 12 months	⊕◯◯◯ Very low[a,b,c]	-	The mean person/participant generic health-related quality of life at post-intervention was 0	MD **0** (3.91 lower to 3.91 higher)	MID = 3 (SF-12 established MID)
Person/participant generic health-related quality of life (AQOL, unclear range, higher values are better, final value) at post-intervention	283 (1 RCT) follow-up: mean 4 weeks	⊕⊕⊕⊕ High	-	The mean person/participant generic health-related quality of life at post-intervention was 0.22	MD **0** (0.1 lower to 0.1 higher)	MID = 0.22 (0.5 x median control group SD)
Person/participant generic health-related quality of life (EQ5D-5L, -0.11-1, higher values are better, final values) at follow up	41 (1 RCT) follow-up: mean 9 months	⊕◯◯◯ Very low[c,d]	-	The mean person/participant generic health-related quality of life at follow up was 0.62	MD **0.1 lower** (0.25 lower to 0.05 higher)	MID = 0.03 (EQ5D established MID)
Six minute walk test ([meters] higher values are better, change scores and final values) at post-intervention	1154 (14 RCTs) follow-up: mean 15.6 weeks	⊕◯◯◯ Very low[c,e,f]	-	The mean six minute walk test at post-intervention was 214.5	MD **42.08 meters higher** (24.21 higher to 59.96 higher)	MID = 28 meters (established MID)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
Six minute walk test ([meters], higher values are better, change scores and final values) at follow up	517 (7 RCTs) follow-up: mean 16.4 weeks	⨁◯◯◯ Very low[c,f,g]	-	The mean six minute walk test at follow up was 216.8	MD **47.93 meters higher** (22.37 higher to 73.48 higher)	MID = 28 meters (established MID)
Walking speed (10 meter walk test, comfortable walk test [m/s], higher values are better, change scores) at post-intervention	169 (2 RCTs) follow-up: mean 34 weeks	⨁◯◯◯ Very low[a,b,f]	-	The mean walking speed at post-intervention was 0.008	MD **0.03 m/s higher** (0.05 lower to 0.12 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Walking speed (10 meter walk test, gait speed, comfortable walk test [m/s], higher values are better, final values) at post-intervention	825 (8 RCTs) follow-up: mean 7.4 weeks	⨁⨁◯◯ Low[c,h]	-	The mean walking speed at post-intervention was 0.71	MD **0.16 m/s higher** (0.12 higher to 0.21 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Walking speed (10 meter walk test, unclear units, higher values are better, final values) at post-intervention	22 (1 RCT) follow-up: mean 6 weeks	⨁◯◯◯ Very low[c,i]	-	The mean walking speed at post-intervention was 35.27	MD **0.91 higher** (5.08 lower to 6.9 higher)	MID = 2.80 (0.5 x baseline SDs)
Walking speed (comfortable walking speed [m/s], higher values are better, change scores) at follow up	36 (1 RCT) follow-up: 16 weeks	⨁⨁⨁◯ Moderate[g]	-	The mean walking speed at follow up was 0.03	MD **0 m/s** (0.09 lower to 0.09 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Walking speed (comfortable walk test, gait speed [m/s], higher values are better, final values) at follow up	451 (5 RCTs) follow-up: mean 14.8 weeks	⨁◯◯◯ Very low[c,i]	-	The mean walking speed at follow up was 0.71	MD **0.14 m/s higher** (0.09 higher to 0.2 higher)	MID = 0.2 m/s (established MID for chronic stroke)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
Functional mobility measures (timed up and go [seconds], lower values are better, change scores and final values) at post-intervention	728 (10 RCTs) follow-up: mean 11.4 weeks	⊕⊕⊕◯ Moderate[e]	-	The mean functional mobility measures at post-intervention was 14.9	MD **2.63 seconds fewer** (4.44 fewer to 0.82 fewer)	MID = 10 seconds (established MID)
Functional mobility measures (Functional Ambulation Classification, FMA-LL [different scale ranges], higher values are better, final values) at post-intervention	50 (2 RCTs) follow-up: mean 3 weeks	⊕⊕⊕◯ Moderate[c]	-	-	SMD **0.28 SD higher** (0.28 lower to 0.84 higher)	MID = 0.5 (SMD)
Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up	484 (6 RCTs) follow-up: mean 17.6 weeks	⊕⊕◯◯ Low[j]	-	The mean functional mobility measures at follow up was 19.77	MD **2.93 seconds lower** (5.21 lower to 0.65 lower)	MID = 10 seconds (established MID)
Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at post-intervention	685 (10 RCTs) follow-up: mean 11 weeks	⊕⊕⊕◯ Moderate[e]	-	-	SMD **0.3 SD higher** (0.15 higher to 0.45 higher)	MID = 0.5 (SMD)
Measures of standing balance (step test [number of steps], higher values are better, change	142 (2 RCTs) follow-up: mean 28 weeks	⊕◯◯◯ Very low[a,b,c]	-	The mean measures of standing balance at post-intervention was 3	MD **1.11 steps higher** (0.68 lower to 1.33 higher)	MID = 1.88 (0.5 x median control group SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
score and final value) at post-intervention						
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention	30 (1 RCT) follow-up: 4 weeks	⨁◯◯◯ Very low b,c,k	-	The mean measures of standing balance at post-intervention was 5.27	MD **1.33 higher** (2.93 lower to 5.59 higher)	MID = 5.1 (0.5 x median baseline SDs)
Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at follow up	454 (4 RCTs) follow-up: mean 18.5 weeks	⨁⨁◯◯ Low j	-	-	SMD **0.25 SD higher** (0.06 higher to 0.44 higher)	MID = 0.5 (SMD)
Measures of motor impairment (affected knee strength [kg], higher values are better, change score) at post-intervention	130 (1 RCT) follow-up: 12 months	⨁⨁◯◯ Low a,b	-	The mean measures of motor impairment at post-intervention was -0.1	MD **0.3 kg higher** (2.22 lower to 2.82 higher)	MID = 4.73 (0.5 x median baseline SD)
Measures of motor impairment (paretic leg muscle strength [newtons], higher values are better, final value) at post-intervention	63 (1 RCT) follow-up: 19 weeks	⨁⨁⨁◯ Moderate c	-	The mean measures of motor impairment at post-intervention was 205.3	MD **17.9 Newtons higher** (26.59 lower to 62.39 higher)	MID = 35.7 (0.5 x median baseline SD)
Measures of motor impairment (K-trunk impairment scale, 0-23, higher values are better, final	29 (1 RCT) follow-up: mean 8 weeks	⨁◯◯◯ Very low b,c,e	-	The mean measures of motor impairment at post-intervention was 14.82	MD **2.35 higher** (0.21 higher to 4.49 higher)	MID = 1.48 (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 any other intervention	Risk difference with circuit class training	
values) at post-intervention						
Activities of daily living (Barthel index, FIM [different scale ranges], higher are better, final values) at post-intervention	303 (2 RCTs) follow-up: mean 4 weeks	⊕⊕⊕⊕ High	-	-	SMD **0.12 SD lower** (0.36 lower to 0.12 higher)	MID = 0.5 (SMD)
Activities of daily living (Barthel index, 0-100, higher are better, final value) at follow up	30 (1 RCT) follow-up: 6 weeks	⊕⊕⊕⊕ High	-	The mean activities of daily living at follow up was 74.67	MD **16 higher** (7.59 higher to 24.41 higher)	MID = 1.85 (established MID 1.85)
Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, change score) at post-intervention	36 (1 RCT) follow-up: 12 weeks	⊕◯◯◯ Very low[c,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was -3	MD **12 higher** (2.52 higher to 21.48 higher)	MID = 17 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - physical domain, different scale ranges, higher values are better, final values) at post-intervention	323 (2 RCTs) follow-up: mean 11.5 weeks	⊕⊕⊕◯ Moderate[c]	-	-	SMD **0.13 SD lower** (0.36 lower to 0.1 higher)	MID = 0.5 (SMD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - recovery score, 0-100, higher values are better, final value) at post-intervention	283 (1 RCT) follow-up: 4 weeks	⊕⊕⊕⊕ High	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was 50	MD **0** (8.34 lower to 8.34 higher)	MID = 20 (0.5 x median control group SD)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, final value) at follow up	36 (1 RCT) follow-up: 16 weeks	⊕◯◯◯ Very low[c,g]	-	The mean stroke-specific Patient-Reported Outcome Measures at follow up was -9	MD **16 higher** (2.51 higher to 29.49 higher)	MID = 17 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (SSQOL, unclear scale range, higher values are better, final value) at follow up	41 (1 RCT) follow-up: 9 months	⊕◯◯◯ Very low[c,d]	-	The mean stroke-specific Patient-Reported Outcome Measures at follow up was 3.63	MD **0.25 lower** (0.72 lower to 0.22 higher)	MID = 0.34 (0.5 x median baseline SD 0.34)
Length of hospital stay ([days], lower values are better, final value) at post-intervention	30 (1 RCT) follow-up: 4 weeks	⊕⊕⊕◯ Moderate[b]	-	The mean length of hospital stay at post-intervention was 67.5	MD **26.8 days fewer** (52.84 fewer to 0.76 fewer)	MID = 21.5 (0.5 x median control group SD)
Adverse events at post-intervention	673 (8 RCTs) follow-up: mean 14.5 weeks	⊕◯◯◯ Very low[e,m,n]	RD 0.02 (-0.03 to 0.08)	99 per 1,000	**20 more per 1,000** (30 fewer to 80 more)[l]	Precision calculated through Optimal Information Size (OIS) due to zero events in some studies. OIS determined power for the sample size = 0.33 (0.8-0.9 = serious, <0.8 = very serious).
Adverse events at follow up	107 (3 RCTs) follow-up:	⊕◯◯◯ Very low[h,m,n]	RD 0.02 (-0.10 to 0.06)	358 per 1,000	**20 more per 1,000** (10 fewer	Precision calculated through Optimal

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training	
	mean 19 weeks				to 60 more)[l]	Information Size (OIS) due to zero events in some studies. OIS determined power for the sample size = 0.03 (0.8-0.9 = serious, <0.8 = very serious).

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

b. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)

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

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

e. 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 deviation from the intended intervention, bias due to missing outcome data and bias in measurement of the outcome)

f. Downgraded by 1 increment because heterogeneity, unexplained by subgroup analysis

g. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias arising from the randomisation process and bias due to missing outcome data)

h. 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 deviation from the intended intervention and bias due to missing outcome data)

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

j. 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)

k. 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 in measurement of the outcome)

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

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

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

Table 4: Clinical evidence summary: Circuit class training compared to other types of circuit training

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with other types of circuit training	Risk difference with circuit class training	
Six minute walk test ([meters], higher values are better, final values) at post-intervention	90 (2 RCTs) follow-up: 14 weeks	⊕◯◯◯ Very low[a,b,c]	-	The mean six minute walk test at post-intervention was 376.95	MD **30.25 meters higher** (96.83 lower to 157.34 higher)	MID = 28 meters (established MID)
Walking speed (10m walk test [m/s], higher values are better, final values) at post-intervention	43 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,b,c]	-	The mean walking speed at post-intervention was 1.4	MD **0.3 m/s higher** (0.03 higher to 0.57 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Measures of standing balance (Berg balance scale, 0-56, higher values are better, final value) at post-intervention	43 (1 RCT) follow-up: 4 weeks	⊕◯◯◯ Very low[a,c]	-	The mean measures of standing balance at post-intervention was 54.1	MD **0** (1.45 lower to 1.45 higher)	MID = 2.8 (0.5 x baseline median SD)
Adverse events at post-intervention	93 (3 RCT) follow-up: 14 weeks	⊕◯◯◯ Very low[a,e]	RD 0.00 (-0.09 to 0.09)	0 per 1,000	**0 fewer per 1,000** (90 fewer to 90 more)[f]	Precision calculated through Optimal Information Size (OIS) due to zero events in some studies. OIS determined power for the sample size = 0.07 (0.8-0.9 = serious, <0.8 = very serious).

[a] Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviation from the intended intervention and bias in measurement of the outcome)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with other types of circuit training	Risk difference with circuit class training	
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 if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs d. Downgraded by 1 increment due to intervention indirectness (does not state staff: participant ratio) e. Downgraded by 2 increments for imprecision due to zero events and small sample size f. Absolute effect calculated by risk difference due to zero events in at least one arm of one study						

Table 5: Clinical evidence summary: Circuit class training 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 circuit class training	
Six minute walk test ([meters], higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⊕◯◯◯ Very low[a,b]	-	The mean six minute walk test at post-intervention was 5.3	MD **18.3 meters higher** (13.02 lower to 49.62 higher)	MID = 28 meters (established MID)
Functional mobility measures (timed up and go [seconds], lower values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⊕⊕⊕◯ Moderate[a]	-	The mean functional mobility measures at post-intervention was 0.3	MD **0.1 seconds higher** (1.76 lower to 1.96 higher)	MID = 10 seconds (established MID)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - communication, 0-100, higher values are better, change score) at post-intervention	24 (1 RCT) follow-up: 9 weeks	⊕◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was -3.3	MD **24.4 higher** (9.75 higher to 39.05 higher)	MID = 10.95 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome	25 (1 RCT) follow-up: 9 weeks	⊕◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-	MD **7.1 higher** (2.4 lower	MID = 6.87 (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 circuit class training	Comments
Measures (Stroke impact scale - emotion, 0-100, higher values are better, change score) at post-intervention				Reported Outcome Measures at post-intervention was 2.6	to 16.6 higher)	
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - ADL, 0-100, higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⊕⊕◯◯ Low[a]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was -0.2	MD **3.1 higher** (3.53 lower to 9.73 higher)	MID = 10.8 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - hand, 0-100, higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 months	⊕⊕◯◯ Low[a]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was -1.2	MD **7.9 higher** (1.53 lower to 17.33 higher)	MID = 18.42 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - memory, 0-100, higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⊕◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was 6	MD **8.7 lower** (19.44 lower to 2.04 higher)	MID = 12.28 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact	25 (1 RCT) follow-up: 9 weeks	⊕◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome	MD **2.8 lower** (10.5 lower to 4.9 higher)	MID = 9.87 (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 circuit class training	
scale - mobility, 0-100, higher values are better, change score) at post-intervention				Measures at post-intervention was 5.3		
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - participation, 0-100, higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⨁◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was 3.4	MD **0.2 higher** (13.63 lower to 14.03 higher)	MID = 11.5 (0.5 x median baseline SD)
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - strength, 0-100, higher values are better, change score) at post-intervention	25 (1 RCT) follow-up: 9 weeks	⨁◯◯◯ Very low[a,b]	-	The mean stroke-specific Patient-Reported Outcome Measures at post-intervention was -3.8	MD **6.9 higher** (6.45 lower to 20.25 higher)	MID = 13.3 (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 and bias due to deviation from the intended intervention)

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

Table 6: Clinical evidence summary: Circuit class training with education compared to any other intervention

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training with education	
Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at post-intervention	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at post-intervention was 0.001	MD **0.07 higher** (0.06 lower to 0.2 higher)	MID = 0.03 (EQ5D established MID)
Person/participant generic health-related quality of life (SF-36 PCS, 0-100, higher values are better, final value) at post-intervention	33 (1 RCT) follow-up: 5 weeks	⊕◯◯◯ Very low[b,c,d]	-	The mean person/participant generic health-related quality of life at post-intervention was 33.2	MD **1 lower** (8.74 lower to 6.74 higher)	MID = 2 (SF36 established MID)
Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at post-intervention	33 (1 RCT) follow-up: 5 weeks	⊕◯◯◯ Very low[b,c,d]	-	The mean person/participant generic health-related quality of life at post-intervention was 54.8	MD **0.4 lower** (7.42 lower to 6.62 higher)	MID = 3 (SF36 established MID)
Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at follow up	67 (1 RCT) follow-up: 15 months	⊕◯◯◯ Very low[a,b]	-	The mean person/participant generic health-related quality of life at follow up was 0.04	MD **0.01 lower** (0.15 lower to 0.13 higher)	MID = 0.03 (EQ5D established MID)
Person/participant generic health-related quality of life (SF-36 - PCS, 0-100, higher values are better, final value) at follow	31 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c,d]	-	The mean person/participant generic health-related quality of life at follow up was 35.4	MD **0.1 lower** (9.47 lower to 9.27 higher)	MID = 2 (SF36 established MID)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training with education	
up						
Person/participant generic health-related quality of life (SF-36 - MCS, 0-100, higher values are better, final value) at follow up	31 (1 RCT) follow-up: 6 months	⊕◯◯◯ Very low[b,c,d]	-	The mean person/participant generic health-related quality of life at follow up was 55.4	MD **5 lower** (14.22 lower to 4.22 higher)	MID = 3 (SF-36 established MID)
Six minute walk test ([meters], higher values are better, change score) at post-intervention	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean six minute walk test at post-intervention was 5.3	MD **28.2 meters higher** (3.83 lower to 60.23 higher)	MID 28 meters (established MID)
Six minute walk test ([meters], higher values are better, change score) at follow up	67 (1 RCT) follow-up: 15 months	⊕◯◯◯ Very low[a,b]	-	The mean six minute walk test at follow up was -0.5	MD **28.5 meters lower** (76.8 lower to 19.8 higher)	MID = 28 meters (established MID)
Walking speed (10m walk test [m/s], higher values are better, change score) at post-intervention	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean walking speed at post-intervention was -0.02	MD **0.12 m/s higher** (0.03 higher to 0.21 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Walking speed (10m walk test [m/s], higher values are better, change score) at follow up	67 (1 RCT) follow-up: 15 months	⊕◯◯◯ Very low[a,b]	-	The mean walking speed at follow up was 0.15	MD **0.85 m/s higher** (0.16 lower to 1.86 higher)	MID = 0.2 m/s (established MID for chronic stroke)
Functional mobility measures (short physical performance test, 0-12, higher values are better, change	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean functional mobility measures at post-intervention was 0.15	MD **0.85 higher** (0.16 lower to 1.86 higher)	MID = 1.38 (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 any other intervention	Risk difference with circuit class training with education	
score) at post-intervention						
Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention	243 (1 RCT) follow-up: 9 weeks	⊕⊕⊕⊕ High	-	The mean functional mobility measures at post-intervention was 16.4	MD **1 seconds higher** (0.89 lower to 2.89 higher)	MID = 10 seconds (established MID)
Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at follow up	67 (1 RCT) follow-up: 15 months	⊕◯◯◯ Very low[a,b]	-	The mean functional mobility measures at follow up was 0.7	MD **0.6 higher** (0.55 lower to 1.75 higher)	MID = 1.38 (0.5 x median baseline SD)
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,b]	-	The mean measures of standing balance at post-intervention was -0.06	MD **4.16 higher** (0.96 higher to 7.36 higher)	MID = 4.82 (0.5 x median baseline SD)
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at follow up	67 (1 RCT) follow-up: 15 months	⊕⊕◯◯ Low[a]	-	The mean measures of standing balance at follow up was -0.6	MD **1.9 higher** (0.25 lower to 4.05 higher)	MID = 4.82 (0.5 x median baseline SD)
Adverse events (withdrawal due to adverse events) at post-intervention	67 (1 RCT) follow-up: 3 months	⊕◯◯◯ Very low[a,e,f]	RD 0.06 (-0.04 to 0.15)	0 per 1,000	**60 more per 1,000** (40 fewer to 150 more)[g]	Sample size used to determine precision: 75-150 = serious imprecision, <75 = very serious

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with any other intervention	Risk difference with circuit class training with education	
						imprecision.
Adverse events (withdrawal due to adverse events) at follow up	67 (1 RCT) follow-up: 15 months	⊕◯◯◯ Very low[a,e,f]	RD 0.09 (-0.02 to 0.20)	0 per 1,000	**90 more per 1,000** (20 fewer to 200 more)[g]	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 due to deviation from the intended intervention, bias due to missing outcome data 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 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 deviation from the intended intervention, and bias in selection of reported result)

d. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)

e. Downgraded by 1 increment due to outcome indirectness (reports withdrawal due to adverse events rather than all adverse events)

f. Downgraded by 1 increment for imprecision due to zero events and small sample size

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

Table 7: Clinical evidence summary: Circuit class training with education compared to circuit class training (without education)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with circuit class training (without education)	Risk difference with circuit class training with education	
Walking speed (gait speed [m/s], higher values are better, final	40 (1 RCT) follow-up: 4 weeks	⊕⊕◯◯ Low[a,b]	-	The mean walking speed (gait speed [m/s], higher values are better, final	MD **0.2 m/s higher** (0.05 higher to 0.35 higher)	MID 0.2 m/s (established MID for chronic stroke)

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects		Comments
				Risk with circuit class training (without education)	Risk difference with circuit class training with education	
value) at post-intervention				value) at post-intervention was 0.58		
a. Downgraded by 1 increment due to intervention indirectness (The staff ratio is not mentioned and the comparison group includes mental imagery as an extra treatment that is not available in both study arms.) b. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs						

See Appendix F for full GRADE tables.

1.1.7 Economic evidence

1.1.7.1 Included studies

Two health economic studies were included in this review.[8, 11] The first study compared circuit class training to any other intervention[8] while the second compared circuit class training with education to any other intervention.[11] Note that the second study was also included as part of the community participation review for this guideline.

These studies are summarised in the health economic evidence profiles below (Table 4 and Table 5) and the health economic evidence tables in **Error! Reference source not found.**.

1.1.7.2 Excluded studies

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

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

1.1.8 Summary of included economic evidence

Table 4: Health economic evidence profile: Circuit training interventions to improve walking compared to standard care

Study	Applicability	Limitations	Other comments	Incremental cost	Incremental effects	Cost effectiveness	Uncertainty
Dean 2018[8]	Partially applicable[(a)]	Potentially serious limitations[(b)]	• Within-RCT analysis (Dean 2018[8]). • Cost-utility analysis (health outcome: QALYs) • Population: Adults with stroke living in the community for at least 1 month since discharge, with self-reported difficulty with stairs, slopes or uneven surfaces. • Comparators: 1. Treatment as usual (n=22) This ranged from zero treatment to engagement with any health service(s). All participants were asked to not participate in additional physical rehabilitation (either NHS or private). All people received an advice booklet about exercise. 2. Circuit based training (ReTrain program) (n=23). Circuit class training delivered in a community setting (one gym, two church halls and one community centre) with twice-weekly 2-hour sessions over 3 months, comprising: an introductory one-to-one session (home visit); 10 twice-weekly group classes with up to 2 trainers and 8 clients (training venue); a closing one-to-one session (home visit); followed by 3 (one per month) drop-in sessions. Participants completed home-based training throughout. • Follow-up: 9 months	£777[(c)]	-0.045 QALYs[(d)] From clinical review (2-1) – same paper: [(e)] EQ-5D-5L scores (higher values are better, final value) at 9-months post-randomisation: -0.10 Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up**:** 4.81 Other outcomes were reported	Results suggested that the ReTrain intervention dominates usual care (lower costs and higher QALYs).	Cost CI: not reported EQ-5D-5L 95% CI at 9-month follow-up: -0.25 to 0.05 (p=NR) No sensitivity analyses undertaken.

Study	Applicability	Limitations	Other comments	Incremental cost	Incremental effects	Cost effectiveness	Uncertainty
					and can be seen in clinical evidence table.		

Abbreviations: 95% CI= 95% confidence interval; EQ-5D-5L= Euroqol 5 dimensions - 5 level version (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); n/a= not applicable; NR= not reported; RCT= randomised controlled trial; QALYs= quality-adjusted life years

(a) Mean EQ-5D-5L scores (UK tariff) at 9 months were used to calculate the cost per QALY gained for this review: the NICE reference case currently prefers EQ-5D-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) Pilot feasibility RCT (n=45) 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 costs from a single trial. The 9-month follow-up period may not capture full health effects of the intervention if these persist. Furthermore, cost sources were not reported, making it difficult to assess how the intervention compared to current practice: only the total intervention cost per participant was reported and it was unclear whether this included the training course fees (set at £649[1]) that instructors were required to complete before delivering the program, while other healthcare resource use was collected but not included. Sensitivity analysis was not performed on areas of uncertainty.

(c) 2016 UK pounds (£). Cost components incorporated: Staff time (trainers, administrator, and facilitators), venue hire, training equipment (annualised over time), course materials, consumables and travel costs (participants, trainers and facilitators).

(d) QALYs not reported but were estimated using 9-month EQ-5D-5L scores collected within the study and assuming no difference in mortality.

(e) Mean difference taken from Appendix E.1 (Circuit class training compared to any other intervention– Forest plots). Rounded to one decimal place from -0.06 reported in the study.

Table 5: Circuit class training with education compared to any other intervention

Study	Applicability	Limitations	Other comments	Incremental cost	Incremental effects	Cost effectiveness	Uncertainty
Harrington 2010[11] (UK)	Partially applicable[(a)]	Potentially serious limitations[(b)]	• Within-RCT analysis (Harrington 2010[11]) • Cost consequence analysis (various health outcomes) • Population: Adults with stroke living in the community for at least three months • Comparators: 1. Standard care plus an information sheet detailing local groups and contact numbers	£746[(c)]	From clinical review (2- 1);[11] Functional mobility measures[(d)] (timed up and go [seconds], lower values	n/a	No sensitivity analyses undertaken.

			(n=124). In all areas stroke survivors were invited to a six-month review. 2. Community exercise and education scheme in addition to standard care (n=119) held twice weekly for eight weeks. Circuit class training was facilitated by volunteers and qualified exercise instructors (supported by a physiotherapist), each with nine participants plus carers or family members. Sessions were held in leisure and community centres and consisted of 1 hour of exercise followed by a short break, and 1 hour of interactive education. • Follow-up: 12 months		are better, final value) at post-intervention: 1.00		

Abbreviations: n/a= not applicable; RCT= randomised controlled trial

(a) QALYs not used. 2005 resource use and unit costs may not reflect current UK NHS context.

(b) Within-trial analysis and so only reflects this study and not the wider evidence base identified in the clinical review. Unclear if follow up (12 months) was sufficient to assess the full costs and benefits. Sensitivity analyses not performed.

(c) 2005 UK pounds. Cost components included: NHS costs (primary care consultations, secondary care, community care and prescribed medication), and social care costs (home care, meals on wheels, use of a day centre and social worker time). See Table 13 in Appendix H for cost breakdown between intervention groups.

(d) Mean difference taken from Appendix E.4 (Circuit class training with education compared to any other intervention) of guideline clinical review. The study reports outcomes relevant to the review as median and interquartile range values, that could not be used in the analysis of the clinical evidence and so were not extracted in the clinical review. In the circuit class training review, unpublished data was obtained from a Cochrane review for the outcome of the timed up and go test for this study that included mean and standard deviation values. This outcome was not relevant to the community participation review.

Circuit class training with education compared to any other intervention

1.1.9 Economic model

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

1.1.10 Unit costs

Group training interventions require additional resource use compared to not providing such interventions. As described in Section 1.1.5 Summary of studies included in the effectiveness evidence, in studies included in the clinical review, circuit classes were most commonly delivered by a physiotherapist in an outpatient setting with a staff to participant ratio between 1:3 and 1:6 and took place 3 times per week for six weeks and were approximately 60-minute sessions. This would equate to costs of £150 to £372 using the physiotherapist costs shown in Table 6.

However, studies included in the clinical review reported varied resource use (see **Error! Reference source not found.** for details). Key differences in resource use were due to:

- Variation in method of delivery of therapy sessions: studies reported a staff to participant ratio ranging from 1:2-6. The lower the ratio, the more staff are required to assist with the group training, increasing costs.
- The frequency and duration of the group training delivered, with sessions ranging from 30-60 minutes, occurring 2-5 days per week. In the included clinical studies, the interventions were delivered for between 2 weeks and 3 months.
- Staff who delivered the intervention varied as studies reported that treatment was delivered by either physiotherapists, occupational therapists, or trained instructors. The health economic study (Harrington 2010[11]) used rehabilitation therapists, trained instructors and trained volunteers to deliver the intervention.
- Study setting: interventions were conducted in hospitals, community and leisure centres, church halls and physiotherapy outpatient rehabilitation centres. Non-clinical settings will incur lower or no costs compared to clinical settings.
- Additional resource use required to deliver the intervention, such as staff-training costs and information or instructional materials. Several studies included an education component to the intervention. One study (Dean 2018[8]) also mentioned that instructors were specifically trained by the Action for Rehabilitation following Neurological Injury (ARNI) Trust, with courses fees set at £649.[1]

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

Table 6: Unit costs of health care professionals who may be involved in delivering group training interventions

Resource	Cost per working hour (hospital / community) [(a)]	Source
Band 4 PT/OT	£37	PSRRU 2021[14]
Band 5 PT/OT	£41 / £42	
Band 6 PT/OT	£53 / £55	
Band 7 PT/OT	£64 / £66	
Rehabilitation assistant	£33 / £32	PSRRU 2021[14], estimated based on agenda for change band 3 salary[(b)]

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

(a) Note: Costs per working hour include salary, salary oncosts, overheads (management and other non-care staff costs including administration and estates staff), capital overheads and qualification costs.

(b) Band 3 PT/OT not in PSSRU 2021 so salary was assumed to equal Band 3 Mean annual basic pay per FTE for administration and estates staff, NHS England (PSSRU2021 p.149).

1.1.11 Evidence statements

Effectiveness/Qualitative

Economic

One cost-utility analysis found that for people following stroke, circuit-based training was dominated (higher costs and lower quality of life) by usual care. This analysis was assessed as partially applicable with potentially serious limitations.

One cost-consequence analysis found that for people following stroke, a community exercise and education scheme was dominated by usual care, incurring higher costs (£746 more per participant) after 12 months, while the clinical evidence reported that the intervention performed worse on a functional mobility measure after 9 weeks (mean score of 17.4 seconds (SD 7.5)) (16.4 seconds (SD 7.5)). This analysis 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 generic health-related quality of life, carer generic health-related quality of life, 6-minute walk test, walking speed, functional mobility measures, measures of standing balance, measures of motor impairment activities of daily living, stroke-specific Patient-Reported Outcome Measures, length of hospital stay and adverse events. All outcomes were considered equally important for decision making and therefore have all been rated as critical.

This review updated a published Cochrane review, English, 2018 [10]. Therefore, the outcomes used in this review are the same as those reported in the Cochrane review, with the inclusion of carer generic health-related quality of life to maintain consistency with other reviews in this guideline. Stroke specific Patient Reported Outcome Measures were included in the Cochrane review but combined with health-related quality of life outcomes. These outcomes have been reported separately in this review, for consistency with previous reviews and to provide greater insight into how the interventions affect the persons functional abilities or quality of life more specific to their condition.

The committee chose to investigate these outcomes at post-intervention and follow-up time points as they considered that there could be a difference in the short term and long-term effects of the intervention. The longest follow-up time point available in each study was used for the follow up category.

The committee agreed that there was generally a sufficient amount of evidence available for the majority of the outcomes at both follow up time points with the exception of length of hospital stay which was only reported by one study. Evidence was also more limited for measures of motor impairment and activities of daily living, but it was agreed that there was sufficient evidence available for the committee to make a recommendation.

1.1.12.2 The quality of the evidence

One systematic review and in total 27 randomised controlled trial studies were included in the review. The evidence varied from high to very low quality, with the majority being of low quality. Outcomes were commonly downgraded for risk of bias, inconsistency and imprecision due to uncertainty around the effect estimate. Risk of bias was rated as a concern in the majority of the studies. This was generally due to bias arising from the randomisation process, deviations from the intended interventions, missing outcome data and in the measurement of the reported result.

Inconsistency was present in many of the outcomes which was possibly due to the heterogenous nature of the included evidence which reported differences in the following: types of circuit class exercises, time periods post stroke and intensity of the intervention. Heterogeneity was investigated with sensitivity analyses and the pre-specified subgroup analyses. None of the analyses resolved the heterogeneity so these outcomes were downgraded for inconsistency and a random effects model was used in the analysis. Imprecision was seen in a number of outcomes due to small sample sizes and uncertainty around the effect estimate.

Fourteen outcomes were downgraded for indirectness due to either intervention or outcome indirectness. In most cases this was due to the studies not stating the staff:participant ratio for the circuit classes. The protocol, adapted from the included Cochrane review[10], only included studies with a staff:participant ratio of 1:3. Any studies which did not explicitly state the ratio or had a greater staff ratio were downgraded for intervention indirectness. One study[34] reported withdrawal due to adverse events rather than all adverse events and so outcomes including this data were downgraded for outcome indirectness. One study was considered to have two sources of intervention indirectness as it did not state the staff participant ratio and it compared circuit class training with education to the same circuit class training with mental imagery instead. This did not fit exactly into any of the comparisons included in the protocol, however, it has been classified as circuit class training with education versus circuit class training without education. This study only included one relevant outcome measure so did not greatly influence the results presented in this review.

The committee concluded that the evidence was of a sufficient quality to make recommendations. They acknowledged the very low quality rating of the evidence but this was balanced by the large number of studies reporting many of the outcomes. They noted that a number of studies took place in a wide range of countries which in some cases may limit their applicability to the NHS. However, seven studies took place in the UK and are applicable to an NHS setting. Most of these papers compared circuit class training to any other intervention while one study compared circuit class training with education to any other intervention.

1.1.12.3 Benefits and harms

1.1.12.3.1. Key uncertainties

The committee acknowledged that the evidence was not straightforward. It was difficult to interpret the effect of the intervention due to the variety in how much therapy was provided; whether circuit class training was provided in addition to usual care or as therapy time that would be used by usual care; the differences in levels of supervision and who provided the therapy and the variation in education programmes. Furthermore, the committee noted that limited reporting of participant characteristics, including the severity of stroke symptoms before entering the trial, made it difficult to draw conclusions on which people would respond well to circuit class training.

The committee noted that qualitative benefits may be present with circuit class training that will not be captured in this review. The effects of being in a group and interactions with other people who have had a stroke are likely to have an important effect to help people to know what to expect in their rehabilitation, to come up with solutions for the future and to engage more with the therapy that they are doing. The committee noted that these wider benefits may be present for group therapies beyond circuit training to support people to improve walking (for example: circuit training to improve upper limb function). They supported that group training may be useful for a range of different aims and would suggest that this be considered as an option for other types of therapies as this was considered as a helpful option by the lay members on the committee.

1.1.12.3.2. Circuit class training without education compared to any other intervention, other types of circuit class training and no treatment

The results showed that when circuit class training without education was compared to any other intervention, other types of circuit class training and no treatment, there were clinically important benefits reported in the six minute walk test at post intervention and follow up and length of hospital stay at post intervention. Unclear effects were reported for measures of walking speed, measures of motor impairment and activities of daily living with some outcomes reporting clinically important benefits and others showing no clinically important differences. The majority of these smaller studies reported a benefit. No clinically important difference at both the post-intervention and follow up were seen in functional mobility measures, measures of standing balance, stroke-specific Patient-Reported Outcome Measures and adverse events.

Two clinically important benefits for the other interventions (where the outcome was worse in the circuit class group) were reported for person/participant health-related quality of life measured using the SF-12 physical component at post intervention and EQ-5D at follow up. The committee acknowledged that in the case of the SF-12 physical component outcome there were large differences between the groups at baseline and so the control group almost caught up with the intervention group rather than exceeding it, and if this outcome was reported as a final value it was represent a benefit of the intervention group. Similarly for the EQ-5D there were differences in baseline values between the groups but in this case the control group started with a greater EQ-5D value. Therefore, this result could merely be explained by poorly matched groups at baseline the effect of small sample sizes. A committee member also theorised that lower quality of life scores in the intervention groups could be down to the patients finding the intervention too challenging or potential increase in falls/fear of falling. However, this was not borne out in the data for adverse events.

The committee discussed the benefit reported in length of hospital stay for the intervention group. While this outcome was only based on one small study comparing mobility circuit class training with upper limb circuit training only it reported 24 days fewer spent in hospital. One committee member argued that this finding would have a massive impact on resource use for the NHS and theorised it could be due to people achieving the levels of independence required to be discharged sooner and the criteria for this being strongly linked to walking ability. However, the committee acknowledged that it was only reported by one study which was based in Sweden so may not be so applicable to an NHS setting. The study authors themselves highlighted that this result should be interpreted with caution as it was a secondary outcome and may be influenced by external factors.

The committee concluded that while these outcomes were reported in small studies, which were generally of high or very high risk of bias that the evidence was strong enough to suggest an overall benefit of circuit class training in improving six-minute walk test scores, along with a reduction in hospital stay without any increases in adverse events and falls. The committee agreed that even if these benefits did not translate to consistent overall gains in quality of life or activities of daily living, the fact that mobility has been improved without increases in adverse events would probably lead to a reduction in resource use to the NHS.

Taking into account all of this information, weighing up the benefits and harms identified in the evidence and the expert opinion of the committee, the committee agreed that circuit class training should be considered for people after stroke.

1.1.12.3.3. Circuit class training with education compared to any other intervention and circuit class training without education

The results showed that, when circuit class training with education was compared to any other intervention and circuit class training without education, there were clinically important benefits reported for the 6-minute walk test at post intervention, walking speed at post intervention and follow up and measures of standing balance at follow up. Unclear effects were reported for person/participant health-related quality of life with some outcomes reporting clinically important benefits and others showing clinically important harms or no clinically important differences. No clinically important difference was reported for functional mobility measures at both the post intervention and follow up periods.

A clinically important harm was reported at both the post intervention and follow up for adverse events. However, the committee noted that these were due to medical conditions and acute disease and therefore unlikely to be related to the intervention. Moreover, fall related self-efficacy was separately reported by the study and indicated a higher self-efficacy in the intervention group.

There was also a clinically important harm (where the outcome was worse in the circuit class group) in the 6-minute walk test at follow up, however, at post intervention there was a benefit of circuit class training. It was noted that follow up took place 15 months after the intervention which suggests that any gains in mobility may be lost if participants do not continue training. The study authors also suggested that the benefit in the control group could be explained by baseline differences in mobility between the two treatment groups. The control group had a higher 6-minute walk test at baseline and therefore may find it easier to maintain their mobility levels and to continue improving.

The committee acknowledged the additional benefits that education programs may provide. Lay members on the committee noted that this allowed for more interaction with other people who have had a stroke and the chance to learn from each other during these sessions. This was agreed to be important to be a great source of support during rehabilitation.

Taking into account all of this information, weighing up the benefits and harms identified in the evidence and the expert opinion of the committee, the committee agreed that circuit class training should be considered for people after stroke (which could include education programmes).

1.1.12.4 Cost effectiveness and resource use

The review identified two UK-based health economic analyses. The first study was a within-trial cost-utility analysis of a pilot feasibility RCT. The control group received treatment as usual, which ranged from zero treatment to engagement with any health service(s). All participants were asked to not participate in additional physical rehabilitation (either NHS or private) but received an advice booklet about exercise. The circuit-based training group received twice-weekly 2-hour sessions over 3 months followed by 3 (one per month) drop-in sessions. The results found that the circuit-based training program was dominated (higher costs and lower quality of life) by usual care, reporting a mean cost per participant of £777 for a QALY loss of -0.045. The clinical results also showed that the control group performed better on a functional mobility measure (timed up and go, lower values are better) with a mean difference of 4.81 seconds compared to the intervention group, however this is in contrast to the wider evidence base which reported clinical benefits and no harms compared to usual care. The results suggest that circuit class training is not cost-effective, however, the study was assessed as partially applicable for this review as EQ-5D-5L scores were used to calculate QALYs when the NICE reference case currently prefers EQ-5D-3L. It was also 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. Potentially serious limitations were also identified, as the analysis was based on a pilot feasibility RCT (n=45) 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. The within-trial analysis also meant that results only reflect the health outcomes and costs from a single trial and the 9-month follow-up period may not capture full health effects of the intervention if these persist. Furthermore, cost sources were not reported, making it difficult to assess how the intervention compared to current practice: only the total intervention cost per participant was reported and it was unclear whether this included the training course fees (set at £649[1]) that instructors were required to complete before delivering the program, while other healthcare resource use was collected but not included. Sensitivity analysis was not performed on areas of uncertainty.

The second study analysed compared standard care to a community exercise and education scheme, in which participants carried out a circuit of various exercises adapted to their own capabilities. This was a within-trial cost consequence analysis of an RCT which was included in the clinical review. This study was also included as part of the community participation review for this guideline. The circuit class training intervention was held twice weekly for eight weeks, facilitated by volunteers and qualified exercise instructors (supported by a physiotherapist), each with 9 participants plus carers or family members. Sessions were held in leisure and community centres and consisted of 1 hour of exercise followed by a short break, and 1 hour of interactive education. Committee members agreed that the educational component described in the study reflects similar schemes available in current practice. NHS costs (primary care consultations, secondary care, community care and prescribed medication), and social care costs (home care, meals on wheels, use of a day centre and social worker time) were included.

The main results found that costs associated with the intervention were £746 (95%CI: –£432 to £1,924) higher per participant compared to standard care. The wide confidence interval reported was highlighted to the committee as this creates uncertainty regarding the costs incorporated into the analysis. The cost breakdown provided in the analysis showed that the increase in the intervention costs accounted for only a small proportion of overall additional costs (£99), with the rest of difference coming from other resource use required by the intervention group, such as inpatient and social care. This was potentially due to the intervention being partly staffed by volunteer, suggesting that costs could potentially be higher if the NHS were to fund similar interventions. The clinical results also showed that the standard care group performed better on the timed up and go test, with a mean score of 16.4 seconds (SD 7.5), compared to 17.4 seconds (SD 7.5) observed in the intervention group, however this is in contrast to the wider evidence base which reported clinical benefits and no harms compared to usual care. These results suggest that the circuit class training intervention may not be cost-effective considering the additional costs and lack of clinical benefit. The study was assessed as partially applicable as EQ-5D and QALYs were not reported, and the use of 2005 resource use and unit costs may not reflect current UK NHS context. Potentially serious limitations were noted for this study, largely due to the within-trial analysis when considering the heterogenous nature of the included evidence. Furthermore, it was unclear if time if the 12-month time horizon was sufficient to assess the full costs and benefits. Sensitivity analyses were also not performed.

In addition to these studies, relevant unit costs were presented to the committee to inform consideration of cost-effectiveness. Additional resource use associated with circuit class training will largely relate to staff time, with the majority of studies in the clinical review reporting that a physiotherapist had delivered the intervention in an outpatient setting. Circuit classes most commonly took place three times per week for 6 weeks, with sessions typically lasting 60 minutes. The staff participant ratio varied between studies and ranged from 1:3 – 1:6, with higher proportions of participants incurring lower staff costs. Based on this description it was estimated that the cost of circuit class training would be between £150-£372, based on either a band 6 or 7 physiotherapist delivered the intervention. However, during the committee discussion it was noted that a band 4 or 5 physiotherapist could also deliver the intervention, as well as physiotherapist assistant, which would further reduce staff costs. Additional resource use would also be incurred for interventions containing an educational component or staff training costs. It was not possible to assess the potential for downstream cost-savings based on the clinical evidence reported.

The clinical evidence based was large and suggested an overall benefit of circuit class training (both with and without an educational component) in improving 6-minute walk test scores. Some of the evidence suggested these programmes allowed people to walk faster, improved their balance and ability to complete daily tasks compared to usual care. Committee members acknowledged the additional benefits of emotional support during rehabilitation, as well as the potential for greater interaction between participants resulting from the addition of educational programs. However, the presence of heterogeneity across the clinical studies, the mixed effects reported for several outcomes and a lack of sufficient economic analysis made it challenging to ascertain the clinical and cost effectiveness of circuit class training. Furthermore, variation in the availability of circuit class training interventions across current practice suggests that there would be a resource impact if a recommendation was made. For these reasons, the committee agreed on a 'consider' recommendation for circuit class training as an option for post-stroke adults (rather than something to be offered to everyone), which could include education programmes.

1.1.12.5 Other factors the committee took into account

The committee acknowledged that circuit class training may be used as a method to increase intensity of rehabilitation. The committee agreed that this may be appropriate but only if the intense therapy is delivered for the same amount of time with sufficient healthcare professional input, rather than using a group-based setting as a substitute for individual therapy time. The committee acknowledged that the majority of the evidence was in an outpatient setting but agreed that circuit training could be used in stroke rehabilitation units/wards.

The committee acknowledged several additional benefits to this treatment. Group based circuit classes allowed for people who have had a stroke to interact with each other, which can help them to talk to others who can understand what they are experiencing, to learn from each other and to find emotional support. The lay members on the committee highlighted how crucial this was and how this provided more opportunities to do this. This was noted to be important regardless of the person's walking ability at the start of the program. They acknowledged that group programmes may be associated with challenges, such as seeing other people progressing at different rates which may make it 'a bit depressing', but the overall benefits from interacting with other people were very important.

1.1.13 Recommendations supported by this evidence review

This evidence review supports recommendation 1.13.23.

1.1.14 References

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Appendices

Appendix A – Review protocols

Review protocol for the clinical and cost effectiveness of group training to improve walking

ID	Field	Content
0.	PROSPERO registration number	CRD42021276237
1.	Review title	In people after stroke, what is the clinical and cost effectiveness of group training to improve walking?
2.	Review question	4.6 In people after stroke, what is the clinical and cost effectiveness of group training to improve walking?
3.	Objective	To determine the clinical and cost-effectiveness of group training for people after a stroke
4.	Searches	Key paper: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. The following databases (from inception) will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Epistemonikas • PsycINFO • AMED • CINAHL Searches will be restricted by: • English language studies • Human studies • Date limitation: From January 2017 Other searches: • Inclusion lists of systematic reviews

		The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review. Medline search strategy to be quality assured using the PRESS evidence-based checklist (see methods chapter for full details).
5.	Condition or domain being studied	Adults and young people (16 or older) after a stroke
6.	Population	Inclusion: • Adults (age ≥16 years) who have had a first or recurrent stroke (including people after subarachnoid haemorrhage) Exclusion: • Children (age <16 years) • People who have had a transient ischaemic attack

7.	Intervention	• Circuit class training
		  ○ Definition: An intervention that involves participants receiving physical rehabilitation involving repetitive (within session) practice of functional tasks arranged in a circuit with the aim of improving mobility. This is completed in a group environment, with a staff-to-client ratio of no greater than 1:3 (that is, no more than one staff member per three clients).
		  ○ Providing a minimum of once weekly sessions for a minimum of four weeks
		• Circuit class therapy with education

8.	Comparator/Confounding factors	• Other types of circuit class training • Any other intervention, including: ○ Active interventions aiming at improving mobility/usual care (including individual therapy) • No treatment
9.	Types of study to be included	• Systematic reviews of RCTs • Parallel RCTs If insufficient RCT evidence is available, non-randomised studies will be considered, including: 3. Prospective and retrospective cohort studies 4. Case control studies (if no other evidence identified)

		Published NMAs and IPDs will be considered for inclusion.
10.	Other exclusion criteria	• Non-English language studies. • Crossover RCTs • Non comparative cohort studies • Before and after studies • Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available. • Studies that included exercises solely aimed at improving impairment (such as strengthening, range of motion, or cardiovascular fitness)
11.	Context	People after a stroke. This may include people in a hyperacute (<72 hours), an acute (72 hours – 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:
		• Post-intervention
		• Follow-up (wherever available, for example: 3-6 months post-intervention)
		
		• 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)
		• 6-minute walk test (continuous outcomes will be prioritised)

<table>
<tr><td></td><td></td><td>

Walking speed (continuous outcomes will be prioritised)
5 metre walk test
10 metre walk test
Functional mobility measures
Timed Up and Go (continuous outcomes will be prioritised)
Rivermead Mobility Index (continuous outcomes will be prioritised)
Measures of standing balance

Step Test (continuous outcomes will be prioritised)
Berg Balance Scale (continuous outcomes will be prioritised)
Functional Reach Test (continuous outcomes will be prioritised)

Measures of motor impairment
Lower limb strength (continuous outcomes will be prioritised)
Range of motion (continuous outcomes will be prioritised)
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
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)
Length of hospital stay (continuous outcomes will be prioritised)
Adverse events (dichotomous outcome)

</td></tr>
<tr><td>14.</td><td>Data extraction (selection and coding)</td><td>EndNote will be used for reference management, sifting, citations and bibliographies. All references identified by the searches and from other sources will be screened for inclusion.</td></tr>
</table>

		All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4). 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary. Study investigators may be contacted for missing data where time and resources allow.
15.	Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. • Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) • Non randomised study, including cohort studies: Cochrane ROBINS-I
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 Premorbid Modified Rankin scale • 1-2 • >2 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)
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; Group; Individual; Intervention; Rehabilitation; Stroke; Walking	
33.	Details of existing review of same topic by same authors	N/A	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☒	Completed and published
		☐	Completed, published and being updated

		☐	Discontinued
35..	Additional information	N/A	
36.	Details of final publication	www.nice.org.uk	

Health economic review protocol

Review question	All questions – health economic evidence
Objectives	To identify health economic studies relevant to any of the review questions.
Search criteria	• Populations, interventions, and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.
Search strategy	A health economic study search will be undertaken using population-specific terms and a health economic study filter – see appendix B below. Databases searched: • Centre for Reviews and Dissemination NHS Economic Evaluations Database (NHS EED) – all years (closed to new records April 2015) • Centre for Reviews and Dissemination Health Technology Assessment database – all years (closed to new records March 2018) • International HTA database (INAHTA) – all years • Medline and Embase – from 2014 (due to NHS EED closure)
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2006 (including those included in the previous guideline), abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual (2014).[25] 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 7: Database parameters, filters and limits applied

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 08 January 2023	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	1974 – 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)
Epistemonikos (The Epistemonikos Foundation)	Inception – 08 January 2023	Exclusions (Cochrane reviews) English language
AMED, Allied and Complementary Medicine (OVID)	Inception – 08 January 2023	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, case reports)
Current Nursing and Allied Health Literature - CINAHL (EBSCO)	Inception – 08 January 2023	Exclusions (Medline records) Human English Language
PsycINFO (OVID)	Inception – 08 January 2023	Exclusions (animal studies, letters, case reports)

Database	Dates searched	Search filter used
		Human 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.	exercise movement techniques/ or exercise therapy/ or muscle stretching exercises/ or plyometric exercise/ or resistance training/ or walking/
29.	physical fitness/ or physical exertion/ or physical endurance/ or exp locomotion/
30.	sports/ or bicycling/ or gymnastics/ or weight lifting/ or running/
31.	"task performance and analysis"/ or athletic performance/ or mobility limitation/
32.	physical therapy modalities/ or physical therapy specialty/
33.	(physical adj3 (exercise* or therap* or conditioning or activit* or fitness or endurance)).ti,ab,kf.

34.	((exercise or fitness) adj3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*)).ti,ab,kf.
35.	((training or conditioning) adj3 (intervention or protocol or program or activit or regim*)).ti,ab,kf.
36.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*).ti,ab,kf.
37.	muscle strengthening.ti,ab,kf.
38.	((weight* or strength or resistance) adj (train* or lift* or exercise*)).ti,ab,kf.
39.	or/28-38
40.	fitness centers/
41.	(circuit adj3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*)).ti,ab,kf.
42.	((fitness or exercise*) adj3 (center* or centre* or group* or class or classes or training or program*)).ti,ab,kf.
43.	((task related or sequential) adj3 exercise*).ti,ab,kf.
44.	(group adj2 (therap* or environment* or training or program*)).ti,ab,kf.
45.	(repetitive pract* or functional task*).ti,ab,kf.
46.	or/40-45
47.	27 and 39 and 46
48.	randomized controlled trial.pt.
49.	controlled clinical trial.pt.
50.	randomi#ed.ti,ab.
51.	placebo.ab.
52.	randomly.ti,ab.
53.	Clinical Trials as topic.sh.
54.	trial.ti.
55.	or/48-54
56.	Meta-Analysis/
57.	exp Meta-Analysis as Topic/
58.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
59.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
60.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
61.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
62.	(search* adj4 literature).ab.
63.	(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.
64.	cochrane.jw.
65.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
66.	or/56-65
67.	47 and (55 or 66)

Embase (Ovid) search terms

1.	exp Cerebrovascular accident/
2.	exp Brain infarction/
3.	Stroke Rehabilitation/

4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
6.	"brain attack*".ti,ab.
7.	Intracerebral hemorrhage/
8.	or/1-7
9.	letter.pt. or letter/
10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	(conference abstract or conference paper).pt.
15.	or/9-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animal/ not human/
19.	nonhuman/
20.	exp Animal Experiment/
21.	exp Experimental Animal/
22.	animal model/
23.	exp Rodent/
24.	(rat or rats or mouse or mice).ti.
25.	or/17-24
26.	8 not 25
27.	limit 26 to English language
28.	exp kinesiotherapy/ or stretching exercise/ or muscle stretching/ or muscle exercise/ or plyometrics/ or resistance training/ or walking/ or exercise/ or circuit training/ or endurance training/
29.	fitness/ or exercise intensity/ or endurance/ or exp locomotion/
30.	physical activity/ or sport/ or body building/ or cycling/ or endurance sport/ or jogging/ or running/ or weight lifting/
31.	task performance/ or physical performance/ or athletic performance/ or walking difficulty/
32.	physiotherapy/
33.	(physical adj3 (exercise* or therap* or conditioning or activit* or fitness or endurance)).ti,ab,kf.
34.	((training or conditioning) adj3 (intervention* or protocol* or program* or activit* or regim*)).ti,ab,kf.
35.	((exercise or fitness) adj3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*)).ti,ab,kf.
36.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*).ti,ab,kf.
37.	muscle strengthening.ti,ab,kf.
38.	((weight* or strength or resistance) adj (train* or lift* or exercise*)).ti,ab,kf.
39.	or/28-38
40.	health center/

41.	(circuit adj3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*)).ti,ab,kf.
42.	((fitness or exercise*) adj3 (center* or centre* or group* or class or classes or training or program*)).ti,ab,kf.
43.	((task related or sequential) adj3 exercise*).ti,ab,kf.
44.	(group adj2 (therap* or environment* or training or program*)).ti,ab,kf.
45.	(repetitive pract* or functional task*).ti,ab,kf.
46.	or/40-45
47.	27 and 39 and 46
48.	random*.ti,ab.
49.	factorial*.ti,ab.
50.	(crossover* or cross over*).ti,ab.
51.	((doubl* or singl*) adj blind*).ti,ab.
52.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
53.	crossover procedure/
54.	single blind procedure/
55.	randomized controlled trial/
56.	double blind procedure/
57.	or/48-56
58.	systematic review/
59.	meta-analysis/
60.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
61.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
62.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
63.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
64.	(search* adj4 literature).ab.
65.	(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.
66.	cochrane.jw.
67.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
68.	or/58-67
69.	47 and (57 or 68)

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: [Exercise Movement Techniques] explode all trees

#11.	MeSH descriptor: [Exercise Therapy] explode all trees
#12.	MeSH descriptor: [Muscle Stretching Exercises] explode all trees
#13.	MeSH descriptor: [Plyometric Exercise] explode all trees
#14.	MeSH descriptor: [Resistance Training] explode all trees
#15.	MeSH descriptor: [Walking] explode all trees
#16.	MeSH descriptor: [Physical Fitness] explode all trees
#17.	MeSH descriptor: [Physical Exertion] explode all trees
#18.	MeSH descriptor: [Physical Endurance] explode all trees
#19.	MeSH descriptor: [Locomotion] explode all trees
#20.	MeSH descriptor: [Sports] explode all trees
#21.	MeSH descriptor: [Bicycling] explode all trees
#22.	MeSH descriptor: [Gymnastics] explode all trees
#23.	MeSH descriptor: [Weight Lifting] explode all trees
#24.	MeSH descriptor: [Running] explode all trees
#25.	MeSH descriptor: [Task Performance and Analysis] explode all trees
#26.	MeSH descriptor: [Athletic Performance] explode all trees
#27.	MeSH descriptor: [Mobility Limitation] explode all trees
#28.	MeSH descriptor: [Physical Therapy Modalities] explode all trees
#29.	MeSH descriptor: [Physical Therapy Specialty] explode all trees
#30.	(physical near/3 (exercise* or therap* or conditioning or activit* or fitness or endurance)):ti,ab
#31.	((exercise or fitness) near/3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*)):ti,ab
#32.	((training or conditioning) near/3 (intervention or protocol or program or activit or regim*)):ti,ab
#33.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*):ti,ab
#34.	muscle strengthening:ti,ab
#35.	((weight* or strength or resistance) near (train* or lift* or exercise*)):ti,ab
#36.	(or #10-#35)
#37.	MeSH descriptor: [Fitness Centers] explode all trees
#38.	(circuit near/3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*)):ti,ab
#39.	((fitness or exercise*) near/3 (center* or centre* or group* or class or classes or training or program*)):ti,ab
#40.	((task related or sequential) near/3 exercise*):ti,ab
#41.	(group near/2 (therap* or environment* or training or program*)):ti,ab
#42.	(repetitive pract* or functional task*):ti,ab
#43.	(or #37-#42)
#44.	#9 and #36 and #43

AMED search terms

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

5.	"brain attack*".ti,ab.
6.	or/1-5
7.	case report/
8.	(letter or comment*).ti.
9.	or/7-8
10.	randomized controlled trials/ or random*.ti,ab.
11.	9 not 10
12.	animals/ not humans/
13.	(rat or rats or mouse or mice or rodent*).ti.
14.	or/11-13
15.	6 not 14
16.	exercise movement techniques/ or exercise therapy/ or muscle stretching exercises/ or resistance training/ or walking/
17.	physical fitness/ or physical endurance/ or exp locomotion/
18.	sports/ or bicycling/ or gymnastics/ or running/
19.	"task performance and analysis"/ or mobility limitation/
20.	physical therapy modalities/
21.	(physical adj3 (exercise* or therap* or conditioning or activit* or fitness or endurance)).ti,ab.
22.	((exercise or fitness) adj3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*)).ti,ab.
23.	((training or conditioning) adj3 (intervention or protocol or program or activit or regim*)).ti,ab.
24.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*).ti,ab.
25.	muscle strengthening.ti,ab.
26.	((weight* or strength or resistance) adj (train* or lift* or exercise*)).ti,ab.
27.	or/16-26
28.	(circuit adj3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*)).ti,ab.
29.	((fitness or exercise*) adj3 (center* or centre* or group* or class or classes or training or program*)).ti,ab.
30.	((task related or sequential) adj3 exercise*).ti,ab.
31.	(group adj2 (therap* or environment* or training or program*)).ti,ab.
32.	(repetitive pract* or functional task*).ti,ab.
33.	or/28-32
34.	15 and 27 and 33
35.	randomized controlled trials/
36.	randomized controlled trial.pt.
37.	controlled clinical trial.pt.
38.	placebo.ab.
39.	random*.ti,ab.
40.	trial.ti,ab.
41.	groups.ab.
42.	or/35-41
43.	Meta-Analysis/

44.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
45.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
46.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
47.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
48.	(search* adj4 literature).ab.
49.	(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.
50.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
51.	or/43-50
52.	34 and (42 or 51)

CINAHL search terms

S1.	MW Stroke or MH Cerebral Hemorrhage
S2.	stroke* or cva or poststroke* or apoplexy or "cerebrovascular accident"
S3.	(cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)
S4.	"brain attack*"
S5.	S1 or S2 or S3 or S4
S6.	(MH "Therapeutic Exercise")
S7.	(MH "Walking")
S8.	(MH "Locomotion")
S9.	(MH "Physical Fitness")
S10.	(MH "Sports")
S11.	(MH "Weight Lifting")
S12.	(MH "Running")
S13.	(MH "Gymnastics")
S14.	(MH "Cycling")
S15.	(MH "Physical Therapy")
S16.	(physical N3 (exercise* or therap* or conditioning or activit* or fitness or endurance))
S17.	((exercise or fitness) N3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*))
S18.	((training or conditioning) N3 (intervention or protocol or program or activit or regim*))
S19.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*)
S20.	muscle strengthening
S21.	((weight* or strength or resistance) N1 (train* or lift* or exercise*))
S22.	S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21
S23.	(MH "Fitness Centers")
S24.	(circuit N3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*))
S25.	((fitness or exercise*) N3 (center* or centre* or group* or class or classes or training or program*))
S26.	((task related or sequential) N3 exercise*)
S27.	(group N2 (therap* or environment* or training or program*))
S28.	(repetitive pract* or functional task*)
S29.	S23 or S24 or S25 or S26 or S27 or S28

S30.	S5 and S22 and S29

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.	exp Walking/
17.	exp exercise/
18.	exp Locomotion/
19.	Physical Endurance/
20.	Physical Fitness/
21.	sports/ or bicycling/ or gymnastics/ or running/
22.	exp Athletic Performance/
23.	(physical adj3 (exercise* or therap* or conditioning or activit* or fitness or endurance)).ti,ab.
24.	((exercise or fitness) adj3 (train* or intervention* or protocol* or program* or therap* or activit* or regim*)).ti,ab.
25.	((training or conditioning) adj3 (intervention or protocol or program or activit or regim*)).ti,ab.
26.	(sport* or cycl* or bicycl* or treadmill* or crosstrainer* or cross trainer* or run* or walk*).ti,ab.
27.	muscle strengthening.ti,ab.
28.	((weight* or strength or resistance) adj (train* or lift* or exercise*)).ti,ab.
29.	or/16-28
30.	(circuit adj3 (class or classes or therapy or training or program* or exercise* or arranged or arrangement or repetition*)).ti,ab.
31.	((fitness or exercise*) adj3 (center* or centre* or group* or class or classes or training or program*)).ti,ab.
32.	((task related or sequential) adj3 exercise*).ti,ab.
33.	(group adj2 (therap* or environment* or training or program*)).ti,ab.
34.	(repetitive pract* or functional task*).ti,ab.
35.	or/30-34
36.	15 and 29 and 35

Epistemonikos search terms

1.	(title:((title:((title:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))))) OR abstract:((title:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))))))) OR abstract:((title:((title:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))))) OR abstract:((title:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*))))))))))) AND (title:((physical exercise* OR physical therap* OR physical activit* OR exercise train* OR exercise intervention* OR fitness intervention OR fitness therap* OR exercise program* OR training program* OR training regim* OR training activit* OR conditioning progam* OR conditioning activit* OR conditioning intervention* OR muscle strengthening OR sport* OR cycl* OR bicycl* OR treadmill* OR crosstrainer* OR run* OR walk* OR weight training OR weight lift* OR strength train* OR strength exercise* OR resistance train* OR resistance exercise*)) OR abstract:((physical exercise* OR physical therap* OR physical activit* OR exercise train* OR exercise intervention* OR fitness intervention OR fitness therap* OR exercise program* OR training program* OR training regim* OR training activit* OR conditioning progam* OR conditioning activit* OR conditioning intervention* OR muscle strengthening OR sport* OR cycl* OR bicycl* OR treadmill* OR crosstrainer* OR run* OR walk* OR weight training OR weight lift* OR strength train* OR strength exercise* OR resistance train* OR resistance exercise*))) AND (title:((circuit class OR circuit therap* OR circuit classes OR circuit training OR circuit program* OR circuit repetition* OR fitness center OR fitness centre OR fitness group* OR fitness class OR fitness classes OR exercise class OR exercise classes OR exercise program* OR group therap* OR group environment* OR group training OR group program*)) OR abstract:((circuit class OR circuit therap* OR circuit classes OR circuit training OR

	circuit program* OR circuit repetition* OR fitness center OR fitness centre OR fitness group* OR fitness class OR fitness classes OR exercise class OR exercise classes OR exercise program* OR group therap* OR group environment* OR group training OR group program*)))

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
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

Database	Dates searched	Search filters and limits applied
		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

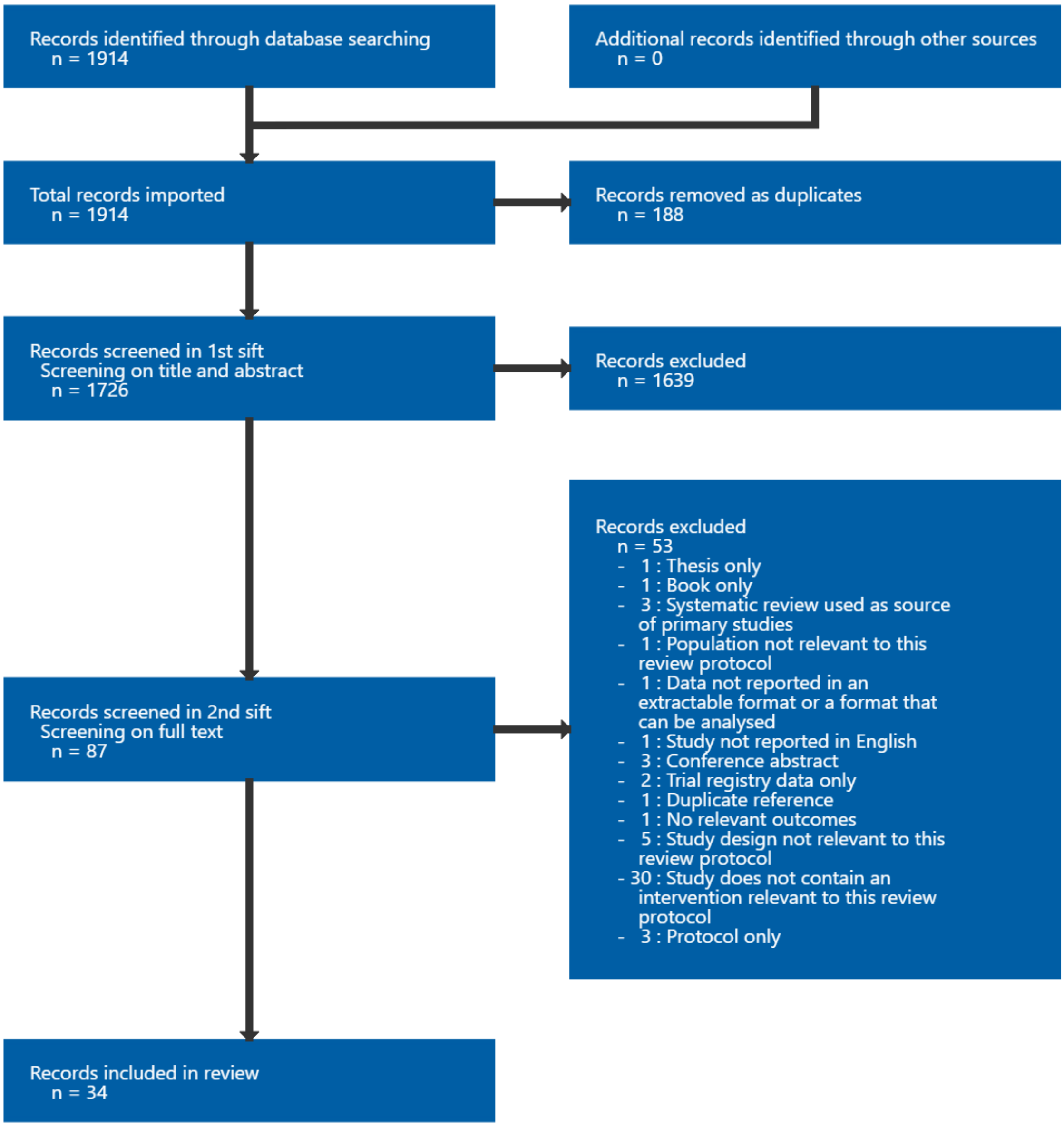
PsycINFO search terms

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 group training for walking



Appendix D – Effectiveness evidence

Ali, 2020

Bibliographic Reference	Ali, M.; Khan, S. U.; Asim, H. A. B.; Effects of individual task specific training verses group circuit training on balance and ambulation in sub-acute stroke; Rawal Medical Journal; 2020; vol. 45 (no. 1); 233-235

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	Pakistan.
Study setting	Outpatient follow up.
Study dates	January to July 2016.
Sources of funding	No additional information.

Inclusion criteria	People aged 50 to 70 years; stroke onset less than 3 months; were able to stand and walk for some distance with or without an assistive device.
Exclusion criteria	No additional information.
Recruitment / selection of participants	People presenting in the Outpatient Department of the Armed Forces Institute of Rehabilitation Medicine.
Intervention(s)	Circuit class training (group based) N=11 Circuit training program performed with 2 or more patients designed focusing on the major impairments of the stroke. This circuit was comprised of five stations including Sit to Stand training, Step up forward, backwards and sideways, trunk control and rotation, reaching out in various directions collecting an object and passing on other side. People were required to spend five minutes on each stations in order to provide intensive treatment experience and more frequent repetitions. Every week there was an increase in difficulty in the task which was in an attempt to increase challenge to the patient. Treatment was 3 sessions of 50 minutes each for six weeks. Concomitant therapy: No additional information.
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Population subgroups	No additional information.
Comparator	Any other intervention (individual based circuit class training) N=11 The same program but completed as an individual with 1:1 supervision. Concomitant therapy: No additional information.
Number of participants	22
Duration of follow-up	6 weeks (post-intervention).
Indirectness	No additional information.
Additional comments	No additional information.

Study arms

Circuit class training (group based) (N = 11)
Circuit training program performed with 2 or more patients designed focusing on the major impairments of the stroke. This circuit was comprised of five stations including Sit to Stand training, Step up forward, backwards and sideways, trunk control and rotation, reaching out in various directions collecting an object and passing on other side. People were required to spend five minutes on each stations in order to provide intensive treatment experience and more frequent repetitions. Every week there was an increase in difficulty in the task which was in an attempt to increase challenge to the patient. Treatment was 3 sessions of 50 minutes each for six weeks. Concomitant therapy: No additional information.

Any other intervention (individual based circuit class training) (N = 11)
The same program but completed as an individual with 1:1 supervision. Concomitant therapy: No additional information.

Characteristics

Study-level characteristics

Characteristic	Study (N = 22)
Mean age (SD) (years) Range	52 to 72
Mean age (SD) (years) Mean (SD)	60.81 (NR)

Arm-level characteristics

Characteristic	Circuit class training (group based) (N = 11)	Any other intervention (individual based circuit class training) (N = 11)
% Female Sample size	n = 4 ; % = 36	n = 5 ; % = 45
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Circuit class training (group based) (N = 11)	Any other intervention (individual based circuit class training) (N = 11)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (Post-intervention)

Continuous outcomes

Outcome	Circuit class training (group based), Baseline, N = 11	Circuit class training (group based), 6 week, N = 11	Any other intervention (individual based circuit class training), Baseline, N = 11	Any other intervention (individual based circuit class training), 6 week, N = 11
Walking speed (10 metre walk test) - Final values (unclear) Final values. Mean (SD)	49.18 (6.62)	36.18 (8.53)	47.45 (4.59)	35.27 (5.47)

Outcome	Circuit class training (group based), Baseline, N = 11	Circuit class training (group based), 6 week, N = 11	Any other intervention (individual based circuit class training), Baseline, N = 11	Any other intervention (individual based circuit class training), 6 week, N = 11
Measures of standing balance (Berg balance scale) - Final values Scale range: 0-54. Final values. Mean (SD)	12.27 (1.19)	40.91 (1.22)	13.45 (3.05)	40.55 (5.16)

Walking speed (10 metre walk test) - Final values - Polarity - Higher values are better
Measures of standing balance (Berg balance scale) - Final values - Polarity - Higher values are better

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

Continuousoutcomes-Walkingspeech(10metrewalktest)-Finalvalues-MeanSD-Circuit class training (group based)-Any other intervention (individual based circuit class training)-t6

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

Continuousoutcomes-Measuresofstandingbalance(Bergbalancescale)-Finalvalues-MeanSD-Circuit class training (group based)-Any other intervention (individual based circuit class training)-t6

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

Blennerhassett, 2004

Bibliographic Reference	Blennerhassett, J.; Dite, W.; Additional task-related practice improves mobility and upper limb function early after stroke: a randomised controlled trial; Australian journal of physiotherapy; 2004; vol. 50 (no. 4); 219-224

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Trial name / registration number	
Study type	Randomised controlled trial (RCT)

Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.

Study arms

Circuit class training (mobility-related CCT) (N = 15)
Mobility-related CCT, 10 5-minute workstations consisting of functional tasks including sit to stand, step ups, obstacle course walking, standing balance, stretching and strengthening exercises); 1 h/day, 5 days/week for 4 weeks. Staff:participant ratio: 1:4. Concomitant therapy: Both groups received additional CCT therapy in addition to usual care

Other type of circuit class training (upper limb-related CCT) (N = 15)
Upper limb-related CCT, 10 5-minute workstations consisting of functional tasks to improve reach to grasp, hand eye co-ordination, stretching and strengthening exercises; 1 h/day, 5 days/week for 4 weeks. Staff:participant ratio: 1:4. Concomitant therapy: Both groups received additional CCT therapy in addition to usual care

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (mobility-related CCT) (N = 15)	Other type of circuit class training (upper limb-related CCT) (N = 15)
% Female Sample size	n = 7 ; % = 47	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	53.9 (19.8)	56.3 (10.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (days) Mean (SD)	36 (25.1)	50.1 (49.2)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

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

Continuous outcomes

Outcome	Circuit class training (mobility-related CCT), Baseline, N = 15	Circuit class training (mobility-related CCT), 4 week, N = 15	Circuit class training (mobility-related CCT), 6 month, N = 15	Other type of circuit class training (upper limb-related CCT), Baseline, N = 15	Other type of circuit class training (upper limb-related CCT), 4 week, N = 15	Other type of circuit class training (upper limb-related CCT), 6 month, N = 15
6-minute walk test - Final values (meters) Final values. Mean (SD)	183 (85)	404 (101)	416 (171)	181 (85)	288 (124)	313 (154)
Functional mobility measures (Timed up and Go test) - Final values (seconds) Final values Mean (SD)	24.3 (7)	11.5 (3.8)	10.8 (4.5)	25.3 (17)	19.1 (14.4)	21.3 (30.3)
Length of hospital stay (start group to discharge) - Final values (days) Final values	NA (NA)	40.7 (28.1)	NA (NA)	NA (NA)	67.5 (43.1)	NA (NA)

Outcome	Circuit class training (mobility-related CCT), Baseline, N = 15	Circuit class training (mobility-related CCT), 4 week, N = 15	Circuit class training (mobility-related CCT), 6 month, N = 15	Other type of circuit class training (upper limb-related CCT), Baseline, N = 15	Other type of circuit class training (upper limb-related CCT), 4 week, N = 15	Other type of circuit class training (upper limb-related CCT), 6 month, N = 15
Mean (SD)						

6-minute walk test - Final values - Polarity - Higher values are better
Functional mobility measures (Timed up and Go test) - Final values - Polarity - Lower values are better
Length of hospital stay (start group to discharge) - Final values - Polarity - Lower values are better

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related CCT)-Other type of circuit class training (upper limb-related CCT)-t4

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related CCT)-Other type of circuit class training (upper limb-related CCT)-t6

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Functionalmobilitymeasures(TimedupandGotest)-Finalvalues-MeanSD-Circuit class training (mobility-related CCT)-Other type of circuit class training (upper limb-related CCT)-t4

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

Continuousoutcomes-Functionalmobilitymeasures(TimedupandGotest)-Finalvalues-MeanSD-Circuit class training (mobility-related CCT)-Other type of circuit class training (upper limb-related CCT)-t6

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

Continuousoutcomes-Lengthofhospitalstay(startgrouptodischarge)-Finalvalues-MeanSD-Circuit class training (mobility-related CCT)-Other type of circuit class training (upper limb-related CCT)-t4

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

Bovonsunthonchai, 2020

Bibliographic Reference	Bovonsunthonchai, S.; Aung, N.; Hiengkaew, V.; Tretriluxana, J.; A randomized controlled trial of motor imagery combined with structured progressive circuit class therapy on gait in stroke survivors; Scientific Reports; 2020; vol. 10 (no. 1); 6945

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Thailand.
Study setting	Outpatient follow up in three centres: the Physical Medicine and Rehabilitation Department, North Okkalapa General Hospital, East General Hospital and National Rehabilitation Hospital, Yangon, Myanmar.
Study dates	January to May 2018.
Sources of funding	This study was funded by the Norway Scholarship (Mahidol-Norway Capacity Building Initiative for ASEAN) and Faculty of Physical Therapy, Mahidol University.

Inclusion criteria	First event of stroke and unilateral involvement of the body; age 18 to 75 years; poststroke duration 3 to 12 months; patients with middle cerebral artery lesion; able to walk a minimum of 10 meters with or without using assistive devices; Functional Ambulation Category (FAC) at least 3; good cognition assessed using the Mini-Mental State Examination at least 24; National Institutes of Health Stroke Scale (NIHSS) <14; good MI ability assessed by the Kinesthetic and Visual Imagery Questionnaire (KVIQ-10) at least 3.
Exclusion criteria	Unstable cardiopulmonary problems (resting heart rate >120bpm, resting systolic blood pressure >180mmHg, resting diastolic blood pressure >100mmHg); other neurological conditions such as Parkinson's disease, Alzheimer's disease or epilepsy; orthopaedic and rheumatologic disorders with weight-bearing pain; unable to communicate or unable to follow commands; serious cardiac conditions such as hospitalisation for heart disease within 3 months, active angina, serious cardiac arrhythmias, hypertrophic cardiomyopathy, severe aortic stenosis; unilateral spatial neglect; ataxic movement; under medication with muscle relaxing effects.
Recruitment / selection of participants	No additional information.
Intervention(s)	Circuit class training with education (structured progressive circuit class training with health education) N=20 25 minutes of health education preceded by 65 minutes of structured program circuit class training. Both groups practiced 3 times a week for 4 weeks. The twenty-five minutes of health education was conducted using pamphlets. The education program involved 12 minutes of explanation of health and 13 minutes discussion on the basis of patient's problems. There were 6 topics of health education,. composed of alteration after stroke, complications, emotional change, how to live at home, high blood pressure and stroke, and preventing recurrent stroke. One HE topic was provided for 2 treatment sessions and the 6 topics were delivered over the 4 weeks of the training program. The circuit training program involved 7 different workstations. The training provided to each participant was provided according to their condition regarding the levels of strength and mobility function status. The training of circuit class training was serial in order and distributed pattern and the participants performed the training in pairs. The patient who was in the rest phase observed while the other patient was in the training phase. To prevent the mental and physical fatigability during the training protocol, rest periods were provided. When people were able to perform the tasks easier, assessed using the score from self-confidence and physical therapist observations, progression was set at an increase in speed of 5-10% from the previous session. Concomitant therapy: No additional information.

Subgroup 1 - Time after stroke at the start of trial	Mixed
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Population subgroups	No additional information.
Comparator	Circuit class training (structured progressive circuit class training with mental imagery) N=20 25 minutes of mental imagery preceded by 65 minutes of structured program circuit class training. Both groups practiced 3 times a week for 4 weeks. The same circuit class training was provided, with mental imagery being practiced in four phases. Before starting the mental imagery, participants were familiarised with the tasks. Practice was performed in a sitting position with eyes closed the 1st person perspective. For visual imagery, to visualise their movements being performed from inside of their body, as if they are looking at their own eyes while performing the movements. For kinaesthetic imagery, to perceive their body sensations of the movements without any movement. During the training, the participants were asked to keep track of the number of repetitions imagined with their fingers. Then, the tasks were progressed by increasing the speed, the rhythm of which was controlled with a metronome. The practice engagements was monitored using a heart rate monitor with oximeter and observed from their finger movements when counting the number of repetitions. Concomitant therapy: No additional information.
Number of participants	40

Duration of follow-up	4 weeks (end of intervention)
Indirectness	Intervention indirectness: The staff ratio is not mentioned and the comparison group includes mental imagery as an extra treatment that is not available in both study arms. It was decided that this could be included but should be downgraded for indirectness.
Additional comments	ITT (no drop outs).

Study arms

Circuit class training with education (structured progressive circuit class training with health education) (N = 20)
25 minutes of health education preceded by 65 minutes of structured program circuit class training. Both groups practiced 3 times a week for 4 weeks. The twenty-five minutes of health education was conducted using pamphlets. The education program involved 12 minutes of explanation of health and 13 minutes discussion on the basis of patient's problems. There were 6 topics of health education,. composed of alteration after stroke, complications, emotional change, how to live at home, high blood pressure and stroke, and preventing recurrent stroke. One HE topic was provided for 2 treatment sessions and the 6 topics were delivered over the 4 weeks of the training program. The circuit training program involved 7 different workstations. The training provided to each participant was provided according to their condition regarding the levels of strength and mobility function status. The training of circuit class training was serial in order and distributed pattern and the participants performed the training in pairs. The patient who was in the rest phase observed while the other patient was in the training phase. To prevent the mental and physical fatigability during the training protocol, rest periods were provided. When people were able to perform the tasks easier, assessed using the score from self-confidence and physical therapist observations, progression was set at an increase in speed of 5-10% from the previous session. Concomitant therapy: No additional information.

Circuit class training (structured progressive circuit class training with mental imagery) (N = 20)
25 minutes of mental imagery preceded by 65 minutes of structured program circuit class training. Both groups practiced 3 times a week for 4 weeks. The same circuit class training was provided, with mental imagery being practiced in four phases. Before starting the mental imagery, participants were familiarised with the tasks. Practice was performed in a sitting position with eyes closed the 1st person perspective. For visual imagery, to visualise their movements being performed from inside of their body, as if they are looking

at their own eyes while performing the movements. For kinaesthetic imagery, to perceive their body sensations of the movements without any movement. During the training, the participants were asked to keep track of the number of repetitions imagined with their fingers. Then, the tasks were progressed by increasing the speed, the rhythm of which was controlled with a metronome. The practice engagements was monitored using a heart rate monitor with oximeter and observed from their finger movements when counting the number of repetitions. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training with education (structured progressive circuit class training with health education) (N = 20)	Circuit class training (structured progressive circuit class training with mental imagery) (N = 20)
% Female Sample size	n = 9 ; % = 45	n = 5 ; % = 25
Mean age (SD) (years) Mean (SD)	55.55 (10.74)	49.9 (11.59)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Weeks) Mean (SD)	28.85 (12.94)	25 (15.46)

Characteristic	Circuit class training with education (structured progressive circuit class training with health education) (N = 20)	Circuit class training (structured progressive circuit class training with mental imagery) (N = 20)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS. Mean (SD)	3.15 (1.31)	3.45 (1.39)

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Continuous outcome

Outcome	Circuit class training with education (structured progressive circuit class training with health education), Baseline, N = 20	Circuit class training with education (structured progressive circuit class training with health education), 4 week, N = 20	Circuit class training (structured progressive circuit class training with mental imagery), Baseline, N = 20	Circuit class training (structured progressive circuit class training with mental imagery), 4 week, N = 20
Walking speed (gait speed) - final value	0.43 (0.24)	0.58 (0.27)	0.44 (0.18)	0.78 (0.21)

Outcome	Circuit class training with education (structured progressive circuit class training with health education), Baseline, N = 20	Circuit class training with education (structured progressive circuit class training with health education), 4 week, N = 20	Circuit class training (structured progressive circuit class training with mental imagery), Baseline, N = 20	Circuit class training (structured progressive circuit class training with mental imagery), 4 week, N = 20
(m/s) Final values. Mean (SD)				

Walking speed (gait speed) - final value - Polarity - Higher values are better

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

Continuousoutcome-walkingspeed(gaitspeed)-finalvalues-MeanSD-Circuit class training with education (structured progressive circuit class training with health education)-Circuit class training (structured progressive circuit class training with mental imagery)-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: The staff ratio is not mentioned and the comparison group includes mental imagery as an extra treatment that is not available in both study arms. It was decided that this could be included but should be downgraded for indirectness.)*

Dean, 2000

Bibliographic Reference	Dean, C. M.; Richards, C. L.; Malouin, F.; Task-related circuit training improves performance of locomotor tasks in chronic stroke: a randomized, controlled pilot trial; Archives of physical medicine and rehabilitation; 2000; vol. 81 (no. 4); 409-417

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Trial name / registration number	
Study type	Randomised controlled trial (RCT)
Inclusion criteria	
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear

Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.

Study arms

Circuit class training (mobility-related circuit class training) (N = 6)
Mobility-related CCT, 10 workstations functional tasks including seated reaching beyond arms' reach, sit to stand, stepping activities, heel lifts, standing balance, strengthening exercises, walking activities; 1 h, 3 times/week for 4 weeks. Staff:participant ratio: 1:6. Concomitant therapy: No additional information.

Any other intervention (upper limb-related circuit class training) (N = 6)
Upper limb-related CCT, workstations consisting of upper limb tasks; 1 h, 3 times/week for 4 weeks. Staff:participant ratio: 1:6. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (mobility-related circuit class training) (N = 6)	Any other intervention (upper limb-related circuit class training) (N = 6)
% Female Sample size	n = 3 ; % = 50	n = 2 ; % = 33.3

Characteristic	Circuit class training (mobility-related circuit class training) (N = 6)	Any other intervention (upper limb-related circuit class training) (N = 6)
Mean age (SD) (years) Mean (SD)	66.2 (7.7)	62.3 (6.6)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (years) Mean (SD)	2.3 (0.7)	1.3 (0.9)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention.)
- 2 month (Follow-up.)

Continuous outcomes

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 5	Circuit class training (mobility-related circuit class training), 4 week, N = 5	Circuit class training (mobility-related circuit class training), 2 month, N = 5	Any other intervention (upper limb-related circuit class training), Baseline, N = 4	Any other intervention (upper limb-related circuit class training), 4 week, N = 4	Any other intervention (upper limb-related circuit class training), 2 month, N = 4
6-minute walk test - Final values (meters) Taken from Cochrane review values. Final values. Mean (SD)	207.9 (119)	250 (135)	277.7 (130.5)	259.6 (154.6)	264.3 (159.1)	261.5 (157.3)
Walking speed (walking speed without assistive devices) - Final values (m/s) Cochrane review values converted to m/s. Paper reports cm/s. Values taken from the Cochrane review, and those in the paper were converted to m/s. Mean (SD)	0.58 (0.51)	0.71 (0.48)	0.79 (0.48)	0.85 (0.53)	0.85 (0.54)	0.78 (0.48)
Functional mobility measures (timed up and go) - final values	27.4 (23.2)	19.5 (14.1)	23.6 (22.9)	29.1 (29.4)	26.1 (25.4)	28.1 (29.5)

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 5	Circuit class training (mobility-related circuit class training), 4 week, N = 5	Circuit class training (mobility-related circuit class training), 2 month, N = 5	Any other intervention (upper limb-related circuit class training), Baseline, N = 4	Any other intervention (upper limb-related circuit class training), 4 week, N = 4	Any other intervention (upper limb-related circuit class training), 2 month, N = 4
(second) Final values. Mean (SD)						
Measures of standing balance (step test) - Final values Final values. Values taken from the Cochrane review. Mean (SD)	NR (NR)	9.8 (4)	NR (NR)	NR (NR)	5.8 (4.3)	NR (NR)

6-minute walk test - Final values - Polarity - Higher values are better
Walking speed (walking speed without assistive devices) - Final values - Polarity - Higher values are better
Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
Measures of standing balance (step test) - Final values - Polarity - Higher values are better

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t4

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t2

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

Continuousoutcomes-Walkingspeed(walkingspeedwithoutassistivedevices)-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t4

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

Continuousoutcomes-Walkingspeed(walkingspeedwithoutassistivedevices)-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t2

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t4

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t2

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

Continuousoutcomes-Measuresofstandingbalance(steptest)-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper limb-related circuit class training)-t4

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

Dean, 2009

Bibliographic Reference	Dean, C. M.; Rissel, C.; Sharkey, M.; Sherrington, C.; Cumming, R. G.; Barker, R. N.; Lord, S. R.; O'Rourke, S. D.; Kirkham, C.; Exercise intervention to prevent falls and enhance mobility in community dwellers after stroke: a protocol for a randomised controlled trial; BMC neurology; 2009; vol. 9; 38

Study details

Secondary publication of another included study- see primary study for details	Dean, C. M., Rissel, C., Sherrington, C. et al. (2012) Exercise to enhance mobility and prevent falls after stroke: the community stroke club randomized trial. Neurorehabilitation and neural repair 26(9): 1046-1057
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.

Dean, 2012

Bibliographic Reference	Dean, C. M.; Rissel, C.; Sherrington, C.; Sharkey, M.; Cumming, R. G.; Lord, S. R.; Barker, R. N.; Kirkham, C.; O'Rourke, S.; Exercise to enhance mobility and prevent falls after stroke: the community stroke club randomized trial; Neurorehabilitation and neural repair; 2012; vol. 26 (no. 9); 1046-1057

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	Dean, C. M., Rissel, C., Sharkey, M. et al. (2009) Exercise intervention to prevent falls and enhance mobility in community dwellers after stroke: a protocol for a randomised controlled trial. BMC neurology 9: 38 This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear

Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Indirectness	Intervention indirectness. Does not mention the staff:participant ratio.

Study arms

Circuit class training (mobility-related circuit class training) (N = 76)
Mobility-related CCT, task-related training with progressive balance, strengthening, standing, walking and stair climbing exercises, home programme and advice to increase walking. Staff:participant ratio: Not reported. Concomitant therapy: No additional information.

Any other intervention (upper-limb related circuit class training) (N = 75)
Upper-limb related CCT, task-related strength and co-ordination training, cognitive training, home programme and advice to increase use of upper limb and engage in more cognitive tasks. Staff:participant ratio: Not reported. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (mobility-related circuit class training) (N = 76)	Any other intervention (upper-limb related circuit class training) (N = 75)
% Female	n = 38 ; % = 50	n = 35 ; % = 47

Characteristic	Circuit class training (mobility-related circuit class training) (N = 76)	Any other intervention (upper-limb related circuit class training) (N = 75)
Sample size		
Mean age (SD) (years) Mean (SD)	66.7 (14.3)	67.5 (10.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Visual impairment Sample size	n = 61 ; % = 80	n = 56 ; % = 75
Hearing impairment Sample size	n = 26 ; % = 34	n = 26 ; % = 35
Parkinson's disease Sample size	n = 1 ; % = 1	n = 1 ; % = 1
PVD/leg ulcers Sample size	n = 4 ; % = 5	n = 5 ; % = 7
Diabetes Sample size	n = 16 ; % = 21	n = 14 ; % = 19
Heart condition	n = 26 ; % = 34	n = 28 ; % = 37

Characteristic	Circuit class training (mobility-related circuit class training) (N = 76)	Any other intervention (upper-limb related circuit class training) (N = 75)
Sample size		
Hypertension Sample size	n = 44 ; % = 57	n = 44 ; % = 59
Asthma/COPD Sample size	n = 16 ; % = 21	n = 11 ; % = 15
Incontinence Sample size	n = 20 ; % = 26	n = 19 ; % = 25
Epilepsy Sample size	n = 14 ; % = 18	n = 11 ; % = 15
osteoporosis Sample size	n = 16 ; % = 21	n = 8 ; % = 11
arthritis Sample size	n = 34 ; % = 45	n = 28 ; % = 37
Hip fracture Sample size	n = 5 ; % = 7	n = 2 ; % = 3
Vertigo/dizziness Sample size	n = 29 ; % = 38	n = 26 ; % = 35
Pain	n = 47 ; % = 62	n = 52 ; % = 69

Characteristic	Circuit class training (mobility-related circuit class training) (N = 76)	Any other intervention (upper-limb related circuit class training) (N = 75)
Sample size		
Time after stroke (years) Mean (SD)	6.7 (6.7)	5.2 (5.4)
Premorbid Modified Rankin scale Mean (SD)	NR (NR)	NR (NR)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 month (Post-intervention)

Continuous outcomes

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 65	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 68
Person/participant generic health-related quality of life (SF-	NA (NA)	NA (NA)	NA (NA)	NA (NA)

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 65	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 68
12) - change scores Scale range: 0-100. Change scores. Mean (SD)				
SF-12 physical composite Mean (SD)	37 (10)	0 (9)	33 (9)	2 (9)
SF-12 mental composite Mean (SD)	50 (11)	0 (11)	50 (12)	0 (12)
6-minute walk test - Change scores (meters) Change scores. Taken from the report by combining the slower walkers and faster walkers scores. Mean (SD)	234 (124)	32 (37.8)	220 (131)	-2.5 (50.5)
Walking speed (10 meter walk test) - change scores (m/s) Change scores. Taken from the report by combining the slower walkers and faster walkers scores. Mean (SD)	0.87 (0.46)	0.015 (0.21)	0.84 (0.52)	-0.054 (0.18)
Functional mobility measures (timed up and go) - Change	25 (28.3)	4.2 (27.1)	30.2 (32.9)	-1.2 (18.3)

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 65	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 68
scores (seconds) Change scores. Mean (SD)				
Measures of standing balance (step test) - Change scores Change scores. Step test, affected (number). Mean (SD)	5.4 (4)	0.4 (2.8)	5.2 (4.1)	0.2 (3.2)

Person/participant generic health-related quality of life (SF-12) - change scores - Polarity - Higher values are better
6-minute walk test - Change scores - Polarity - Higher values are better
Walking speed (10 meter walk test) - change scores - Polarity - Higher values are better
Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
Measures of standing balance (step test) - Change scores - Polarity - Higher values are better

Continuous outcome (Affected knee strength)

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 64	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 66
Measures of motor impairment (affected knee strength) - change scores (kg) Change scores.	19.9 (10.2)	0.4 (7.7)	18.3 (8.7)	0.1 (6.9)

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 64	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 66
Mean (SD)				

Measures of motor impairment (affected knee strength) - change scores - Polarity - Higher values are better

Dichotomous outcome

Outcome	Circuit class training (mobility-related circuit class training), Baseline, N = 76	Circuit class training (mobility-related circuit class training), 12 month, N = 76	Any other intervention (upper-limb related circuit class training), Baseline, N = 75	Any other intervention (upper-limb related circuit class training), 12 month, N = 75
Adverse events Falls. No events. No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Adverse events - Polarity - Lower values are better

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-12)-changescores-SF-12physicalcomposite-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-12)-changescores-SF-12mentalcomposite-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcomes-Walkingspeed(10meterwalktest)-changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-Changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcomes-Measuresofstandingbalance(steptest)-Changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Continuousoutcome(Affectedkneestrength)-Measuresofmotorimpairment(affectedkneestrength)-changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Dichotomousoutcome-Adverseevents-NoOfEvents-Circuit class training (mobility-related circuit class training)-Any other intervention (upper-limb related circuit class training)-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness. Does not mention the staff:participant ratio.)*

Dean, 2018

Bibliographic Reference	Dean, S. G.; Poltawski, L.; Forster, A.; Taylor, R. S.; Spencer, A.; James, M.; Allison, R.; Stevens, S.; Norris, M.; Shepherd, A. I.; Landa, P.; Pulsford, R. M.; Hollands, L.; Calitri, R.; Community-based rehabilitation training after stroke: results of a pilot randomised controlled trial (ReTrain) investigating acceptability and feasibility; BMJ Open; 2018; vol. 8 (no. 2); e018409

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	NCT02429180.
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom.
Study setting	Community based.
Study dates	Recruitment from June 2015 to January 2016. Follow up outcome assessments at 6 months from January to July 2016 and at 9 months from April to October 2016.
Sources of funding	Funded by the Stroke Association and the Peninsula Patient Involvement Group with the ReTrain Stroke Service User Group. The NIHR Collaboration for Leadership in Applied Health Research and Care South West Peninsula at the Royal Devon and Exeter NHS Foundation Trust also supported this work.
Inclusion criteria	Diagnosis of stroke; any time since stroke but at least 1 month since discharge from National Health Service (NHS) physical rehabilitation services; able to walk independently indoors with or without mobility aids, but with self-reported difficulty with stairs, slopes or uneven surfaces; willingness to be randomised and attend the training venue; cognitive capacity and communication ability sufficient to participate.
Exclusion criteria	Less than 18 years old; currently (or within 1 month of) receiving ARNI training or have contraindications to moderate to vigorous physical activity (adapted from American College of Sports Medicine guidelines).
Recruitment / selection of participants	Participants recruited from two CCGs. Identified by: clinicians in NHS primary care, hospital and community stroke services; contacts in the local Clinical Research Network and Clinical Research Facility; promotion via local stroke support networks (eg, Stroke Association); word of mouth, study flyers and adverts.
Intervention(s)	Circuit based training (ReTrain program) N=23 ReTrain involving safe and efficient practice of walking in varied terrains, kerbs, cambers and in crowds, turning and moving quickly, climbing steps and stairs without rails, getting to and from the floor without furniture or other aids and moving

	without mobility aids or while carrying loads. Training is based on a manual and led by personal trainers on the UK Register of Exercise Professionals (level 3 or above) who are ARNI-trained and accredited and have had additional training in the delivery of ReTrain. There was a maximum ratio of one trainer to four stroke survivors. ReTrain was delivered in a community setting (one gym, two church halls and one community centre) with twice-weekly 2-hour sessions over 3 months, comprising: an introductory one-to-one session (home visit); 10 twice-weekly group classes with up to 2 trainers and 8 clients (training venue); a closing one-to-one session (home visit); followed by 3 (one per month) drop-in sessions. Participants completed bespoke home-based training (homework) throughout. Concomitant therapy: No additional information.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Mixed
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	Any other intervention (usual care) N=22 All participants received treatment as usual. This ranged from zero treatment to engagement with any health service(s). All trial participants were asked to not participate in additional physical rehabilitation (either NHS or private). All people received an advice booklet about exercise after stroke.

	Concomitant therapy: No additional information.
Number of participants	45
Duration of follow-up	6 months (post-intervention), 9 months (follow-up).
Indirectness	No additional information.
Additional comments	Method of analysis unclear, does not appear to be ITT.

Study arms

Circuit based training (ReTrain program) (N = 23)
ReTrain involving safe and efficient practice of walking in varied terrains, kerbs, cambers and in crowds, turning and moving quickly, climbing steps and stairs without rails, getting to and from the floor without furniture or other aids and moving without mobility aids or while carrying loads. Training is based on a manual and led by personal trainers on the UK Register of Exercise Professionals (level 3 or above) who are ARNI-trained and accredited and have had additional training in the delivery of ReTrain. There was a maximum ratio of one trainer to four stroke survivors. ReTrain was delivered in a community setting (one gym, two church halls and one community centre) with twice-weekly 2-hour sessions over 3 months, comprising: an introductory one-to-one session (home visit); 10 twice-weekly group classes with up to 2 trainers and 8 clients (training venue); a closing one-to-one session (home visit); followed by 3 (one per month) drop-in sessions. Participants completed bespoke home-based training (homework) throughout. Concomitant therapy: No additional information.

Any other intervention (usual care) (N = 22)
All participants received treatment as usual. This ranged from zero treatment to engagement with any health service(s). All trial participants were asked to not participate in additional physical rehabilitation (either NHS or private). All people received an advice booklet about exercise after stroke. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit based training (ReTrain program) (N = 23)	Any other intervention (usual care) (N = 22)
% Female Sample size	n = 7 ; % = 30	n = 8 ; % = 33
Mean age (SD) (years) Mean (SD)	70 (12)	71 (10)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Hypertension Sample size	n = 18 ; % = 78	n = 18 ; % = 82
Type 2 diabetes mellitus Sample size	n = 4 ; % = 17	n = 4 ; % = 18
Depression Sample size	n = 8 ; % = 35	n = 5 ; % = 23
Chronic kidney disease Sample size	n = 2 ; % = 9	n = 1 ; % = 4

Characteristic	Circuit based training (ReTrain program) (N = 23)	Any other intervention (usual care) (N = 22)
Asthma/COPD Sample size	n = 4 ; % = 17	n = 3 ; % = 14
Other Sample size	n = 5 ; % = 22	n = 3 ; % = 14
< 12 months Sample size	n = 3 ; % = 13	n = 3 ; % = 14
12-24 months Sample size	n = 4 ; % = 17	n = 4 ; % = 18
25-48 months Sample size	n = 5 ; % = 22	n = 5 ; % = 23
49-72 months Sample size	n = 2 ; % = 9	n = 5 ; % = 23
73-96 months Sample size	n = 4 ; % = 17	n = 2 ; % = 9
97+ months Sample size	n = 5 ; % = 22	n = 3 ; % = 14
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Circuit based training (ReTrain program) (N = 23)	Any other intervention (usual care) (N = 22)
0 () Sample size	n = 1 ; % = 4	n = 0 ; % = 0
1 () Sample size	n = 2 ; % = 9	n = 1 ; % = 5
2 () Sample size	n = 4 ; % = 17	n = 9 ; % = 41
3 () Sample size	n = 16 ; % = 70	n = 12 ; % = 55
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 month (Post-intervention)
- 9 month (Follow-up)

Continuous outcomes

Outcome	Circuit based training (ReTrain program), Baseline, N = 23	Circuit based training (ReTrain program), 6 month, N = 21	Circuit based training (ReTrain program), 9 month, N = 21	Any other intervention (usual care), Baseline, N = 22	Any other intervention (usual care), 6 month, N = 20	Any other intervention (usual care), 9 month, N = 20
Person/participant generic health-related quality of life (EQ-5D-5L) - Final values Scale range: -0.11-1. Final values. Mean (SD)	0.51 (0.25)	NR (NR)	0.52 (0.24)	0.55 (0.24)	NR (NR)	0.62 (0.25)
Functional mobility measures (timed up and go) - final values (seconds) Final values. Mean (SD)	27.57 (27.57)	20.76 (19.64)	20.76 (19.25)	21.24 (11.18)	16.37 (9.69)	15.95 (12)
Stroke-specific Patient-Reported Outcome Measures (Stroke Quality of life scale) - Final values Scale range: Unclear. Final values. Mean (SD)	3.31 (0.68)	NR (NR)	3.38 (0.7)	3.45 (0.69)	NR (NR)	3.63 (0.82)

Person/participant generic health-related quality of life (EQ-5D-5L) - Final values - Polarity - Higher values are better
Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
Stroke-specific Patient-Reported Outcome Measures (Stroke Quality of life scale) - Final values - Polarity - Higher values are better

Dichotomous outcome

Outcome	Circuit based training (ReTrain program), Baseline, N = 23	Circuit based training (ReTrain program), 6 month, N = 23	Circuit based training (ReTrain program), 9 month, N = 21	Any other intervention (usual care), Baseline, N = 22	Any other intervention (usual care), 6 month, N = 22	Any other intervention (usual care), 9 month, N = 20
Adverse events Number of people reporting event No of events	n = NA ; % = NA	n = NA ; % = NA	n = 19 ; % = 91	n = NA ; % = NA	n = NA ; % = NA	n = 19 ; % = 95

Adverse events - Polarity - Lower values are better

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-Finalvalues-MeanSD-Circuit based training (ReTrain program)-Any other intervention (usual care)-t9

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit based training (ReTrain program)-Any other intervention (usual care)-t6

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit based training (ReTrain program)-Any other intervention (usual care)-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeQualityoflifescale)-Finalvalues-MeanSD-Circuit based training (ReTrain program)-Any other intervention (usual care)-t9

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

Dichotomousoutcome-Adverseevents-NoOfEvents-Circuit based training (ReTrain program)-Any other intervention (usual care)-t9

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

English, 2015

Bibliographic Reference	English, C.; Bernhardt, J.; Crotty, M.; Esterman, A.; Segal, L.; Hillier, S.; Circuit class therapy or seven-day week therapy for increasing rehabilitation intensity of therapy after stroke (CIRCIT): a randomized controlled trial; International journal of stroke; 2015; vol. 10 (no. 4); 594-602

Study details

Secondary publication of another included study- see primary study for details	Hillier, S., English, C., Crotty, M. et al. (2011) Circuit class or seven-day therapy for increasing intensity of rehabilitation after stroke: protocol of the CIRCIT trial. International journal of stroke 6(6): 560-565
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review. (This study was also extracted for 'Intensity of rehabilitation' and so information from this extraction will be included here.
Trial name / registration number	ACTRN12610000096055
Study type	Randomised controlled trial (RCT)

Study location	Australia
Study setting	People recruited from one of five stroke rehabilitation centers in three states within Australia
Study dates	July 2010 to June 2013
Sources of funding	This project was supported by a National Health and Medical Research Project Council Grant #631904.
Inclusion criteria	People with stroke admitted to a participating rehabilitation facility with a diagnosis of stroke (haemorrhagic or infarct) with an FIM total score of between 40 and 80 points or motor subscale score of between 38 and 62 points will be invited to participate.
Exclusion criteria	People who were not able to walk independently before their stroke
Recruitment / selection of participants	People recruited from one of five stroke rehabilitation centres in three states within Australia
Intervention(s)	Circuit class training N=93 Circuit class therapy for up to 3 hours per day, usually in two 90 minute sessions morning and afternoon. Circuit class therapy involved groups of at least three (and up to six) participants and was staffed by physiotherapists, assistants and physiotherapy students with no more than one staff member to three participants. Where there were less than three participants randomised to the circuit class arm of the trial at any given time, non-trial patients with mobility issues were included in circuit class therapy sessions. Training of trial staff included a half-day workshop conducted at each recruitment site before commencement of the trial. Circuit class therapy sessions were not run according to a strict protocol. Training was intended to guide therapists in how to best adapt their usual practices to the setting. Therapists were encouraged to prescribe exercises and activities that were task-specific, included part- as well as whole-practice of tasks, with an emphasis on repetition and feedback. Circuit class therapy was provided within existing staffing levels at all sites. 5 days a week for 4 weeks. Staff:participant ratio: between 1:3 and 1:6. Concomitant therapy: No additional information.
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)

Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	Any other intervention (usual care) N=190 A combination of two groups. One (n=96) received usual care provided 7 days a week on both Saturday and Sunday for the duration of their inpatient stay, in addition to their usual 5 days therapy. Additional staffing was required. The other (n=94) received usual care dependent on the site provided for 5 days a week. This was done with daily individual therapy and augmented for some people by group physiotherapy 1-4 times a week. Concomitant therapy: No additional information.
Number of participants	283
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Additional comments	Unclear method of analysis

Study arms

Circuit class training (N = 93)
Circuit class therapy for up to 3 hours per day, usually in two 90 minute sessions morning and afternoon. Circuit class therapy involved groups of at least three (and up to six) participants and was staffed by physiotherapists, assistants and physiotherapy students with no more than one staff member to three participants. Where there were less than three participants randomised to the circuit class arm of the trial at any given time, non-trial patients with mobility issues were included in circuit class therapy sessions. Training of trial staff included a half-day workshop conducted at each recruitment site before commencement of the trial. Circuit class therapy sessions were not run according to a strict protocol. Training was intended to guide therapists in how to best adapt their usual practices to the setting. Therapists were encouraged to prescribe exercises and activities that were task-specific, included part- as well as whole-practice of tasks, with an emphasis on repetition and feedback. Circuit class therapy was provided within existing staffing levels at all sites. 5 days a week for 4 weeks. Staff:participant ratio: between 1:3 and 1:6. Concomitant therapy: No additional information.

Any other intervention (usual care) (N = 190)
A combination of two groups. One (n=96) received usual care provided 7 days a week on both Saturday and Sunday for the duration of their inpatient stay, in addition to their usual 5 days therapy. Additional staffing was required. The other (n=94) received usual care dependent on the site provided for 5 days a week. This was done with daily individual therapy and augmented for some people by group physiotherapy 1-4 times a week. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (N = 93)	Any other intervention (usual care) (N = 190)
% Female Sample size	n = 37 ; % = 39.8	n = 79 ; % = 41.5
Mean age (SD) (years) Mean (SD)	70 (12.9)	70.1 (12.9)

Characteristic	Circuit class training (N = 93)	Any other intervention (usual care) (N = 190)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (days) Mean (SD)	30.9 (28.2)	26.8 (17.4)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Continuous outcomes

Outcome	Circuit class training, Baseline, N = 93	Circuit class training, 4 week, N = 93	Any other intervention (usual care), Baseline, N = 190	Any other intervention (usual care), 4 week, N = 190
6-minute walk test - Final values (meters) Final values. Values adapted from the Cochrane review to include the third study arm in the control group. Paper values may be mean (SD) or median (IQR) but included in the Cochrane review as mean (SD), so treated as mean (SD) for this question. Mean (SD)	33 (110.4)	116 (179)	35.1 (107.4)	106.8 (173)
Walking speed (gait speed) - final value (m/s) Final values. Values adapted from the Cochrane review to include the third study arm in the control group. Paper values may be mean (SD) or median (IQR) but included in the Cochrane review as mean (SD), so treated as mean (SD) for this question. Mean (SD)	0.16 (0.44)	0.48 (0.6)	0.16 (0.42)	0.45 (0.61)
Person/participant generic health-related quality of life (AQoL) - Final values Final values. Values adapted from the Cochrane review to include the third study arm in the control group. Paper values may be mean (SD) or median (IQR) but included in the Cochrane review as mean (SD), so treated as mean (SD) for this question. Mean (SD)	NR (NR)	0.22 (0.38)	NR (NR)	0.22 (0.44)
Activities of daily living (Functional Independence Measure) - Final values. Scale range: 18-126. Final values. Mean (SD)	65 (18)	93 (35.8)	66.2 (23)	98 (34.8)

Outcome	Circuit class training, Baseline, N = 93	Circuit class training, 4 week, N = 93	Any other intervention (usual care), Baseline, N = 190	Any other intervention (usual care), 4 week, N = 190
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Final values Scale range: 0-100. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
SIS - Physical Domain score Scale range: 0-100 Mean (SD)	NR (NR)	45.9 (36.9)	NR (NR)	50 (40.2)
SIS - Recovery score Scale range: 0-100 Mean (SD)	NR (NR)	50 (30)	NR (NR)	50 (40)
Length of hospital stay - Final values (days) Final values. Mean (SD)	NA (NA)	46 (38)	NA (NA)	50 (44.1)

6-minute walk test - Final values - Polarity - Higher values are better
Walking speed (gait speed) - final value - Polarity - Higher values are better
Person/participant generic health-related quality of life (AQoL) - Final values - Polarity - Higher values are better
Activities of daily living (Functional Independence Measure) - Final values. - Polarity - Higher values are better
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Final values - Polarity - Higher values are better
Length of hospital stay - Final values - Polarity - Lower values are better

Dichotomous outcome

Outcome	Circuit class training, Baseline, N = 93	Circuit class training, 4 week, N = 93	Any other intervention (usual care), Baseline, N = 190	Any other intervention (usual care), 4 week, N = 190
Adverse events All adverse events No of events	n = NA ; % = NA	n = 21 ; % = 23	n = NA ; % = NA	n = 28 ; % = 15

Adverse events - Polarity - Lower values are better

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Walkingspeed(gaitspeed)-finalvalue-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(AQoL)-Finalvalues-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasure)-Finalvalues.-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Finalvalues-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Finalvalues-SIS-PhysicalDomainscore-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Finalvalues-SIS-Recoveryscore-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Continuousoutcomes-Lengthofstay-Finalvalues-MeanSD-Circuit class training-Any other intervention (usual care)-t4

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

Dichotomousoutcome-Adverseevents-NoOfEvents-Circuit class training-Any other intervention (usual care)-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Harrington, 2010

Bibliographic Reference	Harrington, R.; Taylor, G.; Hollinghurst, S.; Reed, M.; Kay, H.; Wood, V. A.; A community-based exercise and education scheme for stroke survivors: a randomized controlled trial and economic evaluation; Clinical rehabilitation; 2010; vol. 24 (no. 1); 3-15

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Trial name / registration number	
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)

Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	
Duration of follow-up	The only values available are those included in the Cochrane review that investigate the 9 week follow up period. The study reports median values at 9 weeks and 6 months.
Additional comments	

Study arms

Circuit class therapy with education (N = 119)
CCT with exercises adapted to ability aimed at improving balance, strength and endurance, plus home exercise programme, plus interactive self-management education sessions; 1 h exercise and 1 h of education twice a week for 8 weeks. Duration and frequency: not reported. Staff:participant ratio: 2:9 Concomitant therapy: No additional information.

Any other intervention (standard care) (N = 124)
Standard care and information sheet with list of local exercise classes. Duration and frequency: not reported. Staff:participant ratio: 2:9 Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class therapy with education (N = 119)	Any other intervention (standard care) (N = 124)
% Female Sample size	n = 54 ; % = 45	n = 57 ; % = 46
Mean age (SD) (years) Mean (SD)	71 (10.5)	70 (10.2)
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)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints
- Baseline
- 9 week (End of intervention)

Continuous outcomes

Outcome	Circuit class therapy with education, Baseline, N = 119	Circuit class therapy with education, 9 week, N = 119	Any other intervention (standard care), Baseline, N = 124	Any other intervention (standard care), 9 week, N = 124
Functional mobility measures (timed up and go) - final values (seconds) Final values Mean (SD)	NR (NR)	17.4 (7.5)	NR (NR)	16.4 (7.5)

Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training and education-Any other intervention (standard care)-t9

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

Hillier, 2011

Bibliographic Reference	Hillier, S.; English, C.; Crotty, M.; Segal, L.; Bernhardt, J.; Esterman, A.; Circuit class or seven-day therapy for increasing intensity of rehabilitation after stroke: protocol of the CIRCIT trial; International journal of stroke; 2011; vol. 6 (no. 6); 560-565

Study details

Secondary publication of another included study- see primary study for details	English, C., Bernhardt, J., Crotty, M. et al. (2015) Circuit class therapy or seven-day week therapy for increasing rehabilitation intensity of therapy after stroke (CIRCIT): a randomized controlled trial. International journal of stroke 10(4): 594-602
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.

Holmgren, 2010

Bibliographic Reference	Holmgren, E.; Gosman-Hedstrom, G.; Lindstrom, B.; Wester, P.; What is the benefit of a high-intensive exercise program on health-related quality of life and depression after stroke? A randomized controlled trial; Advances in physiotherapy; 2010; vol. 12 (no. 3); 125-133

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Trial name / registration number	NCT00377689
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	>2
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	

Indirectness	Intervention indirectness: Does not provide the staff:participant ratio.

Study arms

Circuit class training with education (N = 15)
Mobility-related circuit-class therapy, focus on physical activity and functional performance and education about falls risk. Circuit class therapy duration not specified, 7 sessions a week for 5 weeks; education 1 h/week for 5 weeks. Staff:participant ratio: not reported. Concomitant therapy: No additional information.

Any other intervention (education only) (N = 19)
Education about coping with hidden dysfunctions after stroke 1 h/week for 5 weeks. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training with education (N = 15)	Any other intervention (education only) (N = 19)
% Female Sample size	n = 6 ; % = 40	n = 7 ; % = 37
Mean age (SD) (years) Mean (SD)	77.7 (7.6)	79.2 (7.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Circuit class training with education (N = 15)	Any other intervention (education only) (N = 19)
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Diagnosis of depression Sample size	n = 3 ; % = 20	n = 2 ; % = 11
Time after stroke (days) Mean (SD)	139.7 (37.3)	126.8 (28.2)
Premorbid Modified Rankin scale Mean (SD)	2.1 (0.6)	2.1 (0.6)
Severity Mean (SD)	NR (NR)	NR (NR)

Outcomes

Study timepoints

- Baseline
- 5 week (Post-intervention)
- 6 month (Follow-up)

Continuous outcomes

Outcome	Circuit class training with education, Baseline, N = 15	Circuit class training with education, 5 week, N = 14	Circuit class training with education, 6 month, N = 13	Any other intervention (education only), Baseline, N = 19	Any other intervention (education only), 5 week, N = 19	Any other intervention (education only), 6 month, N = 18
Person/participant generic health-related quality of life (SF-36) - Final values Scale range: 0-100. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
SF-36 physical component summary Mean (SD)	30.9 (8.3)	32.2 (10.6)	35.3 (13.3)	30.8 (10.7)	33.2 (12)	35.4 (12.9)
SF-36 mental component summary Mean (SD)	53.6 (10)	54.4 (10.3)	50.4 (15)	52.8 (9.2)	54.8 (10)	55.4 (9.3)

Person/participant generic health-related quality of life (SF-36) - Final values - Polarity - Higher values are better

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Finalvalues-SF-36physicalcomponentsummary-MeanSD-Circuit class training with education-Any other intervention (education only)-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Does not report staff:participant ratio.)*

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Finalvalues-SF-36mentalcomponentsummary-MeanSD-Circuit class training with education-Any other intervention (education only)-t5

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Does not report staff:participant ratio.)*

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Finalvalues-SF-36mentalcomponentsummary-MeanSD-Circuit class training with education-Any other intervention (education only)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Does not report staff:participant ratio.)*

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36)-Finalvalues-SF-36physicalcomponentsummary-MeanSD-Circuit class training with education-Any other intervention (education only)-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Does not report staff:participant ratio.)*

Kang, 2021

Bibliographic Reference	Kang, D.; Park, J.; Jeong, I.; Eun, S. D.; Comparing the effects of multicomponent exercise with or without power training on the cardiorespiratory fitness, physical function, and muscular strength of patients with stroke: a randomized controlled trial; Journal of Sports Medicine & Physical Fitness; 2021; vol. 15; 15

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	Republic of Korea.
Study setting	People admitted to the sports center of N Hospital in Seoul, Republic of Korea.
Study dates	No additional information.
Sources of funding	This research was funded by a grant (#15-C-01) from the Korea National Rehabilitation Research Institute, Seoul, Republic of Korea.
Inclusion criteria	Diagnosed with stroke; Korean version of mini-mental state examination score at least 23; ability to follow verbal instructions and to communicate; participated voluntarily.
Exclusion criteria	Neurological disorders other than stroke (e.g. Parkinson's disease); orthopedic problems in the lower extremities; other cardiopulmonary diseases.
Recruitment / selection of participants	People admitted to the sports center of N Hospital in Seoul, Republic of Korea.
Intervention(s)	Circuit class training N=30 A multicomponent exercise program performed for 60 minutes per session, three times a week for 8 weeks. The program consisted of warm-up, circuit training, core muscle exercise, game-based recreational programs and cooldown. In circuit training, people performed aerobic and resistance exercises. Four to seven movements combined with resistance and aerobic exercises were determined as a set. One circuit was considered complete when the patient finished one set consisting of these movements. To reduce fatigue, upper and lower body exercises were alternated, and a 1-2 minute recovery was allowed after each exercise set. Resistance (squats, lunges, deadlift, chest press, pull down, back row or seated row, biceps curl, triceps extension, shoulder press and lateral raise) and aerobic exercises (high knee, side step, knee up, pogo jump, jumping jack, front step and back step) were performed. The velocity and technique of the resistance exercises varied for the high-speed (n=15) and low-speed strength training multicomponent groups (n=15). Both groups used an elastic band for therapy, but the rate was faster in the high-speed group. Therapy also included core training and a game-based recreational program. Concomitant therapy: No additional information.

Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	Any other intervention (stretching) N=15 Whole-body static stretching performed for 1 hour per class, twice a week for 8 weeks. Concomitant therapy: No additional information.
Number of participants	45
Duration of follow-up	8 weeks (post-intervention).
Indirectness	Intervention indirectness: Staff:participant ratio not stated.
Additional comments	No additional information (does not appear to be intention to treat).

Study arms

Circuit class training (N = 30)
A multicomponent exercise program performed for 60 minutes per session, three times a week for 8 weeks. The program consisted of warm-up, circuit training, core muscle exercise, game-based recreational programs and cooldown. In circuit training, people performed aerobic and resistance exercises. Four to seven movements combined with resistance and aerobic exercises were determined as a set. One circuit was considered complete when the patient finished one set consisting of these movements. To reduce fatigue, upper and lower body exercises were alternated, and a 1-2 minute recovery was allowed after each exercise set. Resistance (squats, lunges, deadlift, chest press, pull down, back row or seated row, biceps curl, triceps extension, shoulder press and lateral raise) and aerobic exercises (high knee, side step, knee up, pogo jump, jumping jack, front step and back step) were performed. The velocity and technique of the resistance exercises varied for the high-speed (n=15) and low-speed strength training multicomponent groups (n=15). Both groups used an elastic band for therapy, but the rate was faster in the high-speed group. Therapy also included core training and a game-based recreational program. Staff:participant ratio not stated. Concomitant therapy: No additional information.

Any other intervention (stretching) (N = 15)
Whole-body static stretching performed for 1 hour per class, twice a week for 8 weeks. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	**Circuit class training (N = 30)**	**Any other intervention (stretching) (N = 15)**
% Female Sample size	n = 8 ; % = 44.4	n = 3 ; % = 27.3
Mean age (SD) (years) Mean (SD)	54.06 (3.44)	56.36 (2.76)

Characteristic	Circuit class training (N = 30)	Any other intervention (stretching) (N = 15)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) Mean (SD)	60.45 (23.29)	73.55 (21.6)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Baseline characteristics table reports 18 people in the circuit class training group, 11 people in the any other intervention group.

Outcomes

Study timepoints

- Baseline
- 8 week (Post-intervention)

Continuous outcomes

Outcome	Circuit class training, Baseline, N = 18	Circuit class training, 8 week, N = 18	Any other intervention (stretching), Baseline, N = 11	Any other intervention (stretching), 8 week, N = 11
Functional mobility measures (timed up and go) - final values (seconds) Final values Mean (SD)	15.92 (11.28)	12.4 (8.32)	15.27 (5.21)	15.53 (5.44)
Measures of standing balance (Berg balance scale) - Final values Scale range: 0-56. Final values. Mean (SD)	47.29 (8.99)	50.65 (7.22)	47.55 (5.73)	47.18 (6.27)
Measures of motor impairment (Korean - Trunk impairment scale) - Final values Scale range: 0-23. Final values. Mean (SD)	13.22 (3.45)	17.17 (3.11)	14.91 (2.47)	14.82 (2.68)

Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
Measures of standing balance (Berg balance scale) - Final values - Polarity - Higher values are better
Measures of motor impairment (Korean - Trunk impairment scale) - Final values - Polarity - Higher values are better

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training-Any other intervention (stretching)-t8

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: staff:participant ratio not stated)*

Continuousoutcomes-Measuresofstandingbalance(Bergbalancescale)-Finalvalues-MeanSD-Circuit class training-Any other intervention (stretching)-t8

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: staff:participant ratio not stated)*

Continuousoutcomes-Measuresofmotorimpairment(Korean-Trunkimpairmentscale)-Finalvalues-MeanSD-Circuit class training-Any other intervention (stretching)-t8

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: staff:participant ratio not stated)*

Kim, 2017

Bibliographic Reference	Kim, K.; Jung, S. I.; Lee, D. K.; Effects of task-oriented circuit training on balance and gait ability in subacute stroke patients: a randomized controlled trial; Journal of Physical Therapy Science; 2017; vol. 29 (no. 6); 989-992

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	Inpatients in the rehabilitation centers from South Korea.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Confirmed clinically by computer tomography scans or magnetic resonance imaging; within 6 months after stroke; presented the ability to walk at least 10 meters alone or with an aid, but without standby assistance.
Exclusion criteria	Atrial fibrillation; uncontrolled hypertension; symptoms of unstable cardiac disease; recent pulmonary embolism; subacute systemic illness or infection.

Recruitment / selection of participants	Inpatients in the rehabilitation centres from South Korea.
Intervention(s)	Circuit class training N=15 Task-oriented circuit training at the rehabilitation center, for a total of 50 minutes, five times a week, for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 50 minutes, five times a week for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 20 sessions. All training sessions were organised into groups, with at least 2-3 people/group, and were conducted by two physical therapists (with 3 years of experience in stroke rehabilitation). Task-oriented circuit training was modified and incorporated 10 workstations. It consisted of task-oriented activities for improving balance, walking competence, and respiration ability. At all stations patients practiced for 3 minutes, and this sessions was followed by a 1 minute transfer to the next station. These core practice activities were: sit to stand; stepping; tandem standing; one leg standing; and reaching; walking practice included obstacles, reaching, slope and stairs. These core activities were individually adjusted for each person. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Population subgroups	No additional information.
Comparator	Any other intervention (individual task-oriented exercise) N=15 Exercise focused on task-oriented exercise, such as strengthening exercise (resistance exercise), standing balance (using varying methods) and functional activities for gait improvement. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.
Number of participants	30
Duration of follow-up	4 weeks.
Indirectness	Intervention indirectness: Staff:participant ratio is more than the sufficient amount required in the protocol.
Additional comments	Intention to treat (no dropouts)

Study arms

Circuit class training (N = 15)
Task-oriented circuit training at the rehabilitation center, for a total of 50 minutes, five times a week, for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 50 minutes, five times a week for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 20 sessions. All training sessions were organised into groups, with at least 2-3 people/group, and were conducted by two physical therapists (with 3 years of experience in stroke rehabilitation). Task-oriented circuit training was modified and incorporated 10 workstations. It consisted of task-oriented activities for improving balance, walking competence, and respiration ability. At all stations patients practiced for 3 minutes, and this sessions was followed by a 1 minute transfer to the next station. These core practice activities were: sit to stand; stepping; tandem standing; one leg standing;

and reaching; walking practice included obstacles, reaching, slope and stairs. These core activities were individually adjusted for each person. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.

Any other intervention (individual task-oriented exercise) (N = 15)
Exercise focused on task-oriented exercise, such as strengthening exercise (resistance exercise), standing balance (using varying methods) and functional activities for gait improvement. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (N = 15)	Any other intervention (individual task-oriented exercise) (N = 15)
% Female Sample size	n = 5 ; % = 33	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	57.3 (12.3)	54 (11.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Circuit class training (N = 15)	Any other intervention (individual task-oriented exercise) (N = 15)
Time after stroke (Months) Mean (SD)	3.3 (1.3)	4.4 (1.6)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (Post-intervention)

Continuous outcomes

Outcome	Circuit class training, Baseline, N = 15	Circuit class training, 4 week, N = 15	Any other intervention (individual task-oriented exercise), Baseline, N = 15	Any other intervention (individual task-oriented exercise), 4 week, N = 15
6-minute walk test - Change scores (meter) Change scores Mean (SD)	233.4 (143.8)	103.33 (82.62)	160.7 (115.5)	42.07 (36.09)

Outcome	Circuit class training, Baseline, N = 15	Circuit class training, 4 week, N = 15	Any other intervention (individual task-oriented exercise), Baseline, N = 15	Any other intervention (individual task-oriented exercise), 4 week, N = 15
Functional mobility measures (timed up and go) - Change scores (seconds) Change scores Mean (SD)	20.9 (23.8)	-6.55 (8.76)	27.2 (20.8)	-5.27 (5.25)
Measures of standing balance (Berg Balance Scale) - Change scores Scale range: 0-56. Change scores. Mean (SD)	45 (9.5)	6.6 (6.58)	40.9 (9)	5.27 (5.25)

6-minute walk test - Change scores - Polarity - Higher values are better
Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
Measures of standing balance (Berg Balance Scale) - Change scores - Polarity - Higher values are better

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (individual task-oriented exercise)-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Staff:participant ratio higher than that stated in the protocol.)*

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-Changescores-MeanSD-Circuit class training-Any other intervention (individual task-oriented exercise)-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Staff:participant ratio higher than that stated in the protocol.)*

Continuousoutcomes-Measuresofstandingbalance(BergBalanceScale)-Changescores-MeanSD-Circuit class training-Any other intervention (individual task-oriented exercise)-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Staff:participant ratio higher than that stated in the protocol.)*

Kim, 2016

Bibliographic Reference	Kim, S. M.; Han, E. Y.; Kim, B. R.; Hyun, C. W.; Clinical application of circuit training for subacute stroke patients: a preliminary study; Journal of physical therapy science; 2016; vol. 28 (no. 1); 169-174

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Study arms

Mobility Circuit class training (N = 10)
mobility-related CCT, including trunk exercises, active sitting practice, sit-to-stand practice, standing and walking practice, aerobic exercise and strength training; 90 min/per day, 5 days/ week for 4 weeks

Usual care (N = 10)
Usual care physiotherapy provided in 2 x 30-min sessions, 5 x per week for 4 weeks. Content based on neurodevelopmental approach and provided in one-to-one therapy sessions

Outcomes

Study timepoints
- Baseline
- 4 week

Continuous outcomes

Outcome	Mobility Circuit class training, Baseline, N = 10	Mobility Circuit class training, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
6 minute walk test - final value (meters) Mean (SD)	167.5 (121.8)	261 (115.4)	157.5 (64)	276 (69.8)
Measures of standing balance (Berg balance scale) final value 0-59 Mean (SD)	36.3 (11.7)	46.7 (9.4)	39 (8.7)	49.8 (4.6)
Activties of daily living (Korean modified barthel index) final value 0-100 Mean (SD)	65.7 (23.3)	87 (10.5)	57.4 (22.4)	85.3 (13.7)

Outcome	Mobility Circuit class training, Baseline, N = 10	Mobility Circuit class training, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
Functional mobility measure (FMA - LL) final value 0-34 Mean (SD)	25.4 (7.4)	27.4 (6.7)	22.9 (7.9)	25.9 (4.8)

6 minute walk test - final value - Polarity - Higher values are better
Measures of standing balance (Berg balance scale) final value - Polarity - Higher values are better
Activties of daily living (Korean modified barthel index) final value - Polarity - Higher values are better
Functional mobility measure (FMA - LL) final value - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mobility Circuit class training, Baseline, N = 10	Mobility Circuit class training, 4 week, N = 10	Usual care, Baseline, N = 10	Usual care, 4 week, N = 10
adverse events (serious adverse events) No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

adverse events (serious adverse events) - Polarity - Lower values are better

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

Continuousoutcomes-Functionalmobilitymeasure(FMA-LL)finalvalue-MeanSD-Mobility Circuit class training-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Indirectly applicable *(due to 1:2 staff/pt ratio)*

Continuousoutcomes-Activtiesofdailyliving(Koreanmodifiedbarthelindex)finalvalue-MeanSD-Mobility Circuit class training-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Indirectly applicable *(due to 1:2 staff/pt ratio)*

Continuousoutcomes-Measuresofstandingbalance(Bergbalancescale)finalvalue-MeanSD-Mobility Circuit class training-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Indirectly applicable *(due to 1:2 staff/pt ratio)*

Continuousoutcomes-6minutewalktest-finalvalue-MeanSD-Mobility Circuit class training-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Indirectly applicable *(due to 1:2 staff/pt ratio)*

Dichotomousoutcomes-adverseevents(seriousadverseevents)-NoOfEvents-Mobility Circuit class training-Usual care-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Indirectly applicable *(due to 1:2 staff/pt ratio)*

Knox, 2018

Bibliographic Reference	Knox, M.; Stewart, A.; Richards, C. L.; Six hours of task-oriented training optimizes walking competency post stroke: a randomized controlled trial in the public health-care system of South Africa; Clinical Rehabilitation; 2018; vol. 32 (no. 8); 1057-1068

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	Trial registration no. PACTR201802003054396
Study location	South Africa

Study setting	Outpatients physiotherapy department
Study dates	The trial start date was January 2009 and the end date was November 2011.
Sources of funding	The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Financial support was obtained from the Medical Research Council of South Africa and the Fonds de recherche du Québec-Santé (FRQS).
Inclusion criteria	The inclusion criteria were as follows: patients aged 20–79years, less than six months after the onset of a first ischemic or hemorrhagic stroke, who were medically stable (persons who were human immunodeficiency virus (HIV) seropositive but on antiretroviral (ARV) treatment and stable), and who could walk at least 10m at less than 1.1m/s without assistance but with the use of assistive devices or supervision, if needed. They had to be able to understand and follow instructions, and live near enough to be able to attend the rehabilitation sessions held in the physiotherapy department of a hospital with the help of caregivers.
Exclusion criteria	The exclusion criteria included medical, neurological, or orthopedic conditions that could interfere with their post stroke recovery such as active HIV status, neurological disorders, or musculoskeletal injuries interfering with gait rehabilitation.
Recruitment / selection of participants	Participants were enrolled in the study once a stroke had been diagnosed by the consulting physician at two of the teaching hospitals associated with the University of the Witwatersrand.
Intervention(s)	The Task intervention was conducted for 4–6 pairs of participant and caregiver per session by the first author (M.K.). It consisted of a series of six exercises based on the movement science approach, focused on improving strength, balance, and task performance while standing and walking, and included an endurance walking station.5–7 Chairs, tables, and walls were used to ensure safety and provide support as necessary. Exercises were progressed by reducing the use of these supports and increasing the complexity of the tasks. The caregiver was encouraged to give the correct assistance to the participant in the execution of the tasks and was directed to assist the participant in working on a progressively more difficult structured walking program at home between the formal therapy sessions. All of the participants and their caregivers attended all of the six sessions required of them over the 12-week period that the intervention was undertaken. The participants attended six 1-hour sessions over this 12-week period. Such a regimen was chosen to accommodate the anticipated difficulties in making weekly visits for their rehabilitation. The choice of delivery schedule as well as location and duration of the Task and Strength group interventions was similar and controlled for the distance walked once in the hospital to reach the therapy location.

Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	NR
Comparator	The Strength intervention was delivered by a physiotherapist, experienced in neurological rehabilitation, after training with the first author. It included 10 exercises while sitting and lying targeting the major muscles in the lower extremities. Each exercise consisted of three sets of 10 repetitions and progressed as per the participants' performance and feedback. Resistance was provided with gravity, free weights, elastic bands, and balls. The participants attended six 1-hour sessions over this 12-week period. Such a regimen was chosen to accommodate the anticipated difficulties in making weekly visits for their rehabilitation. The choice of delivery schedule as well as location and duration of the Task and Strength group interventions was similar and controlled for the distance walked once in the hospital to reach the therapy location. Participants in the Control group attended a 90-minute educational session on stroke management that included 20minutes of exercises, provided by an occupational or physiotherapist employed in stroke rehabilitation by the hospital.
Number of participants	144

Duration of follow-up	12 and 24 weeks
Indirectness	NR
Additional comments	NR

Study arms

task-oriented gait training (N = 51)
Task orientated gait training. The participants attended six 1-hour sessions over this 12-week period with their caregiver. It consisted of a series of six exercises and focused on improving strength, balance, and task performance while standing and walking, and included an endurance walking station. Staff:participant ratio: 1:4-6

conventional strength training and education only group combined (N = 93)
The Strength intervention was delivered by a physiotherapist, experienced in neurological rehabilitation, after training with the first author. It included 10 exercises while sitting and lying targeting the major muscles in the lower extremities. Each exercise consisted of three sets of 10 repetitions and progressed as per the participants' performance and feedback. Resistance was provided with gravity, free weights, elastic bands, and balls. Participants in the Control group attended a 90-minute educational session on stroke management that included 20minutes of exercises, provided by an occupational or physiotherapist employed in stroke rehabilitation by the hospital.

Characteristics

Study-level characteristics

Characteristic	Study (N = 144)
Ethnicity	NR

Characteristic	Study (N = 144)
Nominal	
Comorbidities Nominal	NR
Premorbid Modified Rankin scale Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	task-oriented gait training (N = 51)	conventional strength training and education only group combined (N = 93)
% Female Sample size	n = 26 ; % = 51	n = 46 ; % = 31.9
Mean age (SD) Mean (SD)	51 (15)	49.5 (13.2)
Time after stroke (Weeks) Mean (SD)	10 (8)	8.5 (7)

Outcomes

Study timepoints

- Baseline
- 12 week
- 24 week

continuous outcomes

Outcome	task-oriented gait training, Baseline, N = 51	task-oriented gait training, 12 week, N = 45	task-oriented gait training, 24 week, N = 41	conventional strength training and education only group combined, Baseline, N = 93	conventional strength training and education only group combined, 12 week, N = 83	conventional strength training and education only group combined, 24 week, N = 79
6 minute walk test - final value (meters) Mean (SD)	162 (110)	260 (136)	281 (132)	192.5 (110.4)	251.4 (127.1)	263.3 (137.8)
walking speed (Comfortable walking speed) final values (m/s) Mean (SD)	0.44 (0.28)	0.75 (0.36)	0.79 (0.36)	0.53 (0.28)	0.53 (0.28)	0.74 (0.36)
Functional mobility measures (timed up and go) final value (seconds) Mean (SD)	33.9 (31.1)	20.7 (17.1)	17.6 (12.2)	27.2 (22)	20.71 (18.36)	21.2 (18.7)
Measures of standing balance	40 (12)	49 (7)	50 (6.7)	43 (10.1)	47.9 (9.7)	49 (9.2)

Outcome	task-oriented gait training, Baseline, N = 51	task-oriented gait training, 12 week, N = 45	task-oriented gait training, 24 week, N = 41	conventional strength training and education only group combined, Baseline, N = 93	conventional strength training and education only group combined, 12 week, N = 83	conventional strength training and education only group combined, 24 week, N = 79
(berg balance scle) final values 0-56 Mean (SD)						

6 minute walk test - final value - Polarity - Higher values are better
walking speed (Comfortable walking speed) final values - Polarity - Lower values are better
Functional mobility measures (timed up and go) final value - Polarity - Lower values are better
Measures of standing balance (berg balance scle) final values - Polarity - Higher values are better

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

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t24

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-walkingspeed(Comfortablewalkingspeed)finalvalues-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-walkingspeed(Comfortablewalkingspeed)finalvalues-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t24

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Functionalmobilitymeasures(timedupandgo)finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Functionalmobilitymeasures(timedupandgo)finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t24

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Measuresofstandingbalance(bergbalancescle)finalvalues-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Measuresofstandingbalance(bergbalancescle)finalvalues-MeanSD-task-oriented gait training-conventional strength training and education only group combined-t24

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

Marigold, 2005

Bibliographic Reference	Marigold, D. S.; Eng, J. J.; Dawson, A. S.; Inglis, J. T.; Harris, J. E.; Gylfadottir, S.; Exercise leads to faster postural reflexes, improved balance and mobility, and fewer falls in older persons with chronic stroke; J Am Geriatr Soc; 2005; vol. 53 (no. 3); 416-23

Study details

Secondary publication of another included study- see primary study for details	
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)

Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Study arms

Mobility related circuit class training (N = 28)
Mobility-related CCT including walking, standing tasks focused on balance, sit to stand; 1-h sessions, 3 times/week for 10 weeks

Stretching and slow weight shifting exercises (N = 31)
stretching and slow weight shifting exercises; 1-h sessions, 3 times/week for 10 weeks

Outcomes

Study timepoints
- Baseline
- 10 week (post intervention)
- 14 week (1 month retention FU)

Continuous outcomes

Outcome	Mobility related circuit class training, Baseline, N = 28	Mobility related circuit class training, 10 week, N = 22	Mobility related circuit class training, 14 week, N = 19	Stretching and slow weight shifting exercises, Baseline, N = 31	Stretching and slow weight shifting exercises, 10 week, N = 26	Stretching and slow weight shifting exercises, 14 week, N = 23
Functional mobility measure (timed up and go) final values (seconds) Mean (SD)	20.2 (10.8)	16.7 (9.6)	16.9 (10.5)	18.4 (13.1)	17 (10.7)	17.5 (11)
measures of standing balance (berg balance scale) final values 0-59 Mean (SD)	44.7 (6.5)	49.1 (5)	49 (5.4)	44.8 (7.1)	48.1 (5.7)	47.5 (6)

Functional mobility measure (timed up and go) final values - Polarity - Lower values are better
measures of standing balance (berg balance scale) final values - Polarity - Higher values are better

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

Continuousoutcomes-Functionalmobilitymeasure(timedupandgo)finalvalues-MeanSD-Mobility related circuit class training-Stretching and slow weight shifting exercises-t10

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Continuousoutcomes-Functionalmobilitymeasure(timedupandgo)finalvalues-MeanSD-Mobility related circuit class training-Stretching and slow weight shifting exercises-t14

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Continuousoutcomes-measuresofstandingbalance(bergbalancescale)finalvalues-MeanSD-Mobility related circuit class training-Stretching and slow weight shifting exercises-t10

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Continuousoutcomes-measuresofstandingbalance(bergbalancescale)finalvalues-MeanSD-Mobility related circuit class training-Stretching and slow weight shifting exercises-t14

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Marsden, 2010

Bibliographic Reference	Marsden, D.; Quinn, R.; Pond, N.; Golledge, R.; Neilson, C.; White, J.; McElduff, P.; Pollack, M.; A multidisciplinary group programme in rural settings for community-dwelling chronic stroke survivors and their carers: a pilot randomized controlled trial; Clinical rehabilitation; 2010; vol. 24 (no. 4); 328-341

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Not stated/unclear
Subgroup 2 - Premorbid	Mixed

Modified Rankin scale	
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Indirectness	No additional information.

Study arms

Circuit class therapy (N = 12)
Mobility-related CCT, 10 x 5-min workstations consisting of sit to stand, reaching, standing balance, walking figure 8, stationary bike; 1 h exercise and 1 h education, once a week for 7 weeks. Staff:participant ratio: 1:3. Concomitant therapy: No additional information.

No treatment (N = 14)
Wait list control. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class therapy (N = 12)	No treatment (N = 14)
% Female Sample size	n = 2 ; % = 16.7	n = 4 ; % = 30.8

Characteristic	Circuit class therapy (N = 12)	No treatment (N = 14)
Mean age (SD) (years) Mean (SD)	70 (9)	73.1 (9.3)
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)
Premorbid Modified Rankin scale Sample size	n = NA ; % = NA	n = NA ; % = NA
1 () Sample size	n = 4	n = 5
2 () Sample size	n = 5	n = 6 ; % = 46.2
3 () Sample size	n = 3 ; % = 25	n = 0 ; % = 0
4 () Sample size	n = 0 ; % = 0	n = 2 ; % = 15.4

Characteristic	Circuit class therapy (N = 12)	No treatment (N = 14)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 9 week (Post-intervention (end of first phase only))

Continuous outcomes

Outcome	Circuit class therapy, Baseline, N = 12	Circuit class therapy, 9 week, N = 12	No treatment, Baseline, N = 13	No treatment, 9 week, N = 13
6-minute walk test - Change scores (meters) Change scores Mean (SD)	301.6 (121.5)	23.6 (49.5)	349.1 (124.2)	5.3 (25.8)
Functional mobility measures (timed up and go) - Change scores (seconds) Change scores Mean (SD)	13.1 (5.1)	0.4 (2.9)	14.2 (13.7)	0.3 (1.6)

Outcome	Circuit class therapy, Baseline, N = 12	Circuit class therapy, 9 week, N = 12	No treatment, Baseline, N = 13	No treatment, 9 week, N = 13
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Change scores Scale range: 0-100. Change scores. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
SIS - Communication Mean (SD)	77.1 (25.4)	21.1 (23.4)	86 (18.4)	-3.3 (11.1)
SIS - Emotion Mean (SD)	74.3 (12)	9.7 (12.3)	79.9 (15.5)	2.6 (11.9)
SIS - ADL/IADL Mean (SD)	81.9 (21.8)	2.9 (10.1)	85 (21.4)	-0.2 (6.2)
SIS - Hand Mean (SD)	69.6 (36.1)	6.7 (14)	74.2 (37.6)	-1.2 (9.4)
SIS - Memory Mean (SD)	76.8 (27.8)	-2.7 (12.9)	80.5 (21.3)	6 (14.5)
SIS - Mobility Mean (SD)	78.2 (17.2)	2.5 (8.2)	75.4 (22.3)	5.3 (11.3)
SIS - Participation Mean (SD)	65.4 (25.4)	3.6 (18.6)	76.2 (20.7)	3.4 (16.5)

Outcome	Circuit class therapy, Baseline, N = 12	Circuit class therapy, 9 week, N = 12	No treatment, Baseline, N = 13	No treatment, 9 week, N = 13
SIS - Strength Mean (SD)	66.7 (25.2)	3.1 (21.1)	62 (28.1)	-3.8 (11)

6-minute walk test - Change scores - Polarity - Higher values are better
Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Change scores - Polarity - Higher values are better

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-Changescores-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Communication-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Emotion-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-ADL/IADL-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Hand-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Memory-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Mobility-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Participation-MeanSD-Circuit class therapy-No treatment-t9

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale)-Changescores-SIS-Strength-MeanSD-Circuit class therapy-No treatment-t9

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

Martins, 2017

Bibliographic Reference	Martins, J. C.; Aguiar, L. T.; Nadeau, S.; Scianni, A. A.; Teixeira-Salmela, L. F.; Faria, Cdcm; Efficacy of Task-Specific Training on Physical Activity Levels of People With Stroke: Protocol for a Randomized Controlled Trial; Physical therapy; 2017; vol. 97 (no. 6); 640-648

Study details

Secondary publication of another included	Martins, J. C., Nadeau, S., Aguiar, L. T. et al. (2020) Efficacy of task-specific circuit training on physical activity levels and mobility of stroke patients: A randomized controlled trial. Neurorehabilitation 47(4): 451-462

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

Martins, 2020

Bibliographic Reference	Martins, J. C.; Nadeau, S.; Aguiar, L. T.; Scianni, A. A.; Teixeira-Salmela, L. F.; De Morais Faria, C. D. C.; Efficacy of task-specific circuit training on physical activity levels and mobility of stroke patients: A randomized controlled trial; Neurorehabilitation; 2020; vol. 47 (no. 4); 451-462

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	Martins, J. C., Aguiar, L. T., Nadeau, S. et al. (2017) Efficacy of Task-Specific Training on Physical Activity Levels of People With Stroke: Protocol for a Randomized Controlled Trial. Physical therapy 97(6): 640-648
Trial name / registration number	No additional information.

Study type	Randomised controlled trial (RCT)
Study location	Canada.
Study setting	Outpatient follow up.
Study dates	June 2016 and November 2017.
Sources of funding	This study was funded by the following research funding agencies: Coordenacao de Aperfeicoamento de Pessoal Ensino Superior (CAPES - Financial Code 001), Conselho Nacional de Desenvolvimento Cientifico e Tecnologico, Fundacao de Amparo a Pesquisa de Minas Gerias (FAPEMIG), and Pro-reitoria de Pesquisa da Universidade Federal de Minas Gerais (PRPq/UFMG).
Inclusion criteria	Clinical diagnosis of stroke of at least six months; at least 19 years of age; ability to walk 10 meters independently; muscle tone of the elbow flexor muscles <4 on the Modified Ashworth scale; inactive or insufficiently active, based on standardized criteria; medical permission for regular practice of monitored physical activity.
Exclusion criteria	People who had cognitive impairments, as determined by Mini-Mental State Examination education-adjusted cut-off scores and/or comprehensive aphasia; history of severe heart disease and/or uncontrolled blood pressure; pain or other adverse health conditions, which could compromise the performance of the tests or their participation in the proposed interventions.
Recruitment / selection of participants	Recruited from the general community, by contacting health centers and research groups.
Intervention(s)	Circuit class training N=18 Task-specific circuit training divided into 30 minutes of tasks for the upper limb and 30 minutes for the lower limb. The tasks were organised in a circuit with 11-stations that included activities of reaching, grasping, manipulation of different objects, writing, sit-to-stand, step and heel raise activities and walking. The protocol was based in previous studies and included tasks that are commonly limited in subjects with strokes. The participants performed five minutes of exercises in each station, except for the gait training with auditory cue, which lasted 10 minutes. One to two minute rest intervals between stations were allowed. People received feedback on their performance and were encouraged to work as hard as possible and use their paretic limbs, as much as possible. Assistance was offered, only when necessary.

	Concomitant therapy: All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totaling 36 sessions. Both interventions were provided in health centers and laboratory settings. No task or guidance was provided to participants to be performed at home.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	Any other intervention (stretching and memory exercises and education) N=18 Stretching and memory exercise and health education, 3 times a week, 60 minute sessions over 12 weeks. The control group intervention consisted of 40 minutes of static global stretching and 20 minutes of memory exercises, and/or health education sessions. Stretches were performed in three-series of 30 seconds and involved different muscle groups. Most of the stretches were performed in a sitting or lying position. When participants could not self-stretch, they received help. Memory exercises included various activities: memory games, remembering the sequence of objects, bingo, speaking names (of animals, food, objects, people and places); singing passages of music. Health education sessions included information on risk factors for stroke, the importance of correct consumption of medications and fluid intake, frequency of medical consultations, and quality of sleep.

	Concomitant therapy: All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totaling 36 sessions. Both interventions were provided in health centers and laboratory settings. No task or guidance was provided to participants to be performed at home.
Number of participants	36
Duration of follow-up	12 weeks (post-intervention) and 16 weeks (follow up).
Indirectness	No additional information.
Additional comments	Intention to treat analysis.

Study arms

Circuit class training (N = 18)
Task-specific circuit training divided into 30 minutes of tasks for the upper limb and 30 minutes for the lower limb. The tasks were organised in a circuit with 11-stations that included activities of reaching, grasping, manipulation of different objects, writing, sit-to-stand, step and heel raise activities and walking. The protocol was based in previous studies and included tasks that are commonly limited in subjects with strokes. The participants performed five minutes of exercises in each station, except for the gait training with auditory cue, which lasted 10 minutes. One to two minute rest intervals between stations were allowed. People received feedback on their performance and were encouraged to work as hard as possible and use their paretic limbs, as much as possible. Assistance was offered, only when necessary. Concomitant therapy: All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totaling 36 sessions. Both interventions were provided in health centers and laboratory settings. No task or guidance was provided to participants to be performed at home.

Any other intervention (stretching and memory exercises and education) (N = 18)
Stretching and memory exercise and health education, 3 times a week, 60 minute sessions over 12 weeks. The control group intervention consisted of 40 minutes of static global stretching and 20 minutes of memory exercises, and/or health education sessions. Stretches were performed in three-series of 30 seconds and involved different muscle groups. Most of the stretches were performed in a sitting or lying position. When participants could not self-stretch, they received help. Memory exercises included various activities:

memory games, remembering the sequence of objects, bingo, speaking names (of animals, food, objects, people and places); singing passages of music. Health education sessions included information on risk factors for stroke, the importance of correct consumption of medications and fluid intake, frequency of medical consultations, and quality of sleep. Concomitant therapy: All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totaling 36 sessions. Both interventions were provided in health centers and laboratory settings. No task or guidance was provided to participants to be performed at home.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (N = 18)	Any other intervention (stretching and memory exercises and education) (N = 18)
% Female Sample size	n = 10 ; % = 56	n = 10 ; % = 56
Mean age (SD) (years) Mean (SD)	56 (17)	55 (13)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) IQR	64	39
Time after stroke (Months)	52 (NR to NR)	41 (NR to NR)

Characteristic	Circuit class training (N = 18)	Any other intervention (stretching and memory exercises and education) (N = 18)
Median (IQR)		
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (Post-intervention)
- 16 week (Follow up)

Continuous outcomes

Outcome	Circuit class training, Baseline, N = 18	Circuit class training, 12 week, N = 18	Circuit class training, 16 week, N = 18	Any other intervention (stretching and memory exercises and education), Baseline, N = 18	Any other intervention (stretching and memory exercises and education), 12 week, N = 18	Any other intervention (stretching and memory exercises and education), 16 week, N = 18
6-minute walk test - Change scores	320 (136)	14 (41)	3 (44)	324 (128)	-4 (27)	-9 (57)

Outcome	Circuit class training, Baseline, N = 18	Circuit class training, 12 week, N = 18	Circuit class training, 16 week, N = 18	Any other intervention (stretching and memory exercises and education), Baseline, N = 18	Any other intervention (stretching and memory exercises and education), 12 week, N = 18	Any other intervention (stretching and memory exercises and education), 16 week, N = 18
(meters) Change scores Mean (SD)						
Walking speed (comfortable walking speed) - Change scores (m/s) Change scores Mean (SD)	0.94 (0.34)	0.05 (0.14)	0.03 (0.14)	0.95 (0.38)	0.07 (0.16)	0.03 (0.12)
Stroke-specific Patient-Reported Outcome Measures (SSQOL) - Change scores Scale range: 0-245. Change scores. Mean (SD)	191 (39)	9 (14)	7 (23)	184 (29)	-3 (15)	-9 (18)

6-minute walk test - Change scores - Polarity - Higher values are better
Walking speed (comfortable walking speed) - Change scores - Polarity - Higher values are better
Stroke-specific Patient-Reported Outcome Measures (SSQOL) - Change scores - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Circuit class training, Baseline, N = 18	Circuit class training, 12 week, N = 18	Circuit class training, 16 week, N = 18	Any other intervention (stretching and memory exercises and education), Baseline, N = 18	Any other intervention (stretching and memory exercises and education), 12 week, N = 18	Any other intervention (stretching and memory exercises and education), 16 week, N = 18
Adverse events No of events	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0

Adverse events - Polarity - Lower values are better

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t12

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t16

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

Continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t12

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

Continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t16

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(SSQOL)-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t12

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

Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(SSQOL)-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t16

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

Dichotomousoutcomes-Adverseevents-NoOfEvents-Circuit class training-Any other intervention (stretching and memory exercises and education)-t12

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

Dichotomousoutcomes-Adverseevents-NoOfEvents-Circuit class training-Any other intervention (stretching and memory exercises and education)-t16

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

Moore, 2015

Bibliographic Reference	Moore, S. A.; Hallsworth, K.; Jakovljevic, D. G.; Blamire, A. M.; He, J.; Ford, G. A.; Rochester, L.; Trenell, M. I.; Effects of Community Exercise Therapy on Metabolic, Brain, Physical, and Cognitive Function Following Stroke: A Randomized Controlled Pilot Trial; Neurorehabilitation and neural repair; 2015; vol. 29 (no. 7); 623-635

Study details

Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated	Mild (or NIHSS 1-5)

by category or as measured by NIHSS scale)	

Study arms

Mobility circuit class training (N = 20)
Mobility CCT based on FAME programme including warm-up, stretching, functional strengthening, balance, agility & fitness, cool down; 45-60 minutes, 3 times/week for 19 weeks

Home based stretching programme (N = 20)
home stretching programme of matched duration; 45 to 60 minutes 3 times/week for 19 weeks

Outcomes

Study timepoints
- Baseline
- 19 week

continuous outcomes

Outcome	Mobility circuit class training, Baseline, N = 20	Mobility circuit class training, 19 week, N = 20	Home based stretching programme, Baseline, N = 20	Home based stretching programme, 19 week, N = 20
6 minute walk test - final value (meters) Mean (SD)	428 (131)	512 (131)	419 (127)	441 (126)

Outcome	Mobility circuit class training, Baseline, N = 20	Mobility circuit class training, 19 week, N = 20	Home based stretching programme, Baseline, N = 20	Home based stretching programme, 19 week, N = 20
walking speed (m/s) Mean (SD)	1.2 (0.4)	1.5 (0.3)	1.2 (0.3)	1.3 (0.3)
Measures of standing balance (berg balance scale) - final value Mean (SD)	50 (4)	55 (2)	50 (5.6)	52 (5)
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale - physical total) 0-100 Mean (SD)	308 (92)	324 (96)	336 (78)	348 (64)

6 minute walk test - final value - Polarity - Higher values are better
walking speed - Polarity - Lower values are better
Measures of standing balance (berg balance scale) - final value - Polarity - Higher values are better
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale - physical total) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mobility circuit class training, Baseline, N = 20	Mobility circuit class training, 19 week, N = 20	Home based stretching programme, Baseline, N = 20	Home based stretching programme, 19 week, N = 20
Adverse events (any adverse events) No of events	n = 0	n = 0 ; % = 0	*empty data*	n = 0 ; % = 0

Adverse events (any adverse events) - Polarity - Lower values are better

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

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-Mobility circuit class training-Home based stretching programme-t19

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to deviation from intended intervention (adhering))*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

continuousoutcomes-walkingspeed-MeanSD-Mobility circuit class training-Home based stretching programme-t19

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to deviation from intended intervention (adhering))*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

continuousoutcomes-Measuresofstandingbalance(bergbalancescale)-finalvalue-MeanSD-Mobility circuit class training-Home based stretching programme-t19

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to deviation from intended intervention (adhering))*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale-physicaltotal)-MeanSD-Mobility circuit class training-Home based stretching programme-t19

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to deviation from intended intervention (adhering) and measure of outcome)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Dichotomousoutcomes-Adverseevents(anyadverseevents)-NoOfEvents-Mobility circuit class training-Home based stretching programme-t19

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to deviation from intended intervention (adhering))*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Mudge, 2009

Bibliographic Reference	Mudge, S.; Barber, P. A.; Stott, N. S.; Circuit-based rehabilitation improves gait endurance but not usual walking activity in chronic stroke: a randomized controlled trial; Archives of physical medicine and rehabilitation; 2009; vol. 90 (no. 12); 1989-1996

Study details

Other publications associated with	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513.

this study included in review	DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Study arms

Mobility circuit class training (N = 31)
Mobility CCT, 15 2-min workstations including walking, standing balance and strengthening; 50-60 min 3 times/week for 4 week

Social and education classes only (N = 27)
4 social and 4 educational sessions; duration not specified, twice a week for 4 weeks

Outcomes

Study timepoints
- Baseline
- 4 week (post intervention)

- 3 month

continuous outcomes

Outcome	Mobility circuit class training, Baseline, N = 31	Mobility circuit class training, 4 week, N = 30	Mobility circuit class training, 3 month, N = 27	Social and education classes only, Baseline, N = 27	Social and education classes only, 4 week, N = 25	Social and education classes only, 3 month, N = 23
6 minute walk test - final value (meters) Mean (SD)	263 (110)	282 (117)	277 (125)	201 (99)	200 (99)	195 (104)
walking speed (gait speed) - final values (m/s) Mean (SD)	0.76 (0.3)	0.79 (0.28)	0.77 (0.26)	0.62 (0.27)	0.63 (0.25)	0.63 (0.25)
Measures of standing balance (Activties specific balance confidence scale) final values 0-100 Mean (SD)	6.86 (2)	7.36 (1.9)	7.12 (2.1)	6.03 (1.07)	6.42 (1.7)	6.62 (1.7)

6 minute walk test - final value - Polarity - Higher values are better
walking speed (gait speed) - final values - Polarity - Lower values are better
Measures of standing balance (Activties specific balance confidence scale) final values - Polarity - Higher values are better

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

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-Mobility circuit class training-Social and education classes only-t4

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

continuousoutcomes-walkingspeed(gaitspeed)-finalvalues-MeanSD-Mobility circuit class training-Social and education classes only-t4

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

continuousoutcomes-Measuresofstandingbalance(Activtiesspecificbalanceconfidencescale)finalvalues-MeanSD-Mobility circuit class training-Social and education classes only-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to bias in measurement of outcome)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-Mobility circuit class training-Social and education classes only-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-walkingspeed(gaitspeed)-finalvalues-MeanSD-Mobility circuit class training-Social and education classes only-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Measuresofstandingbalance(Activtiesspecificbalanceconfidencescale)finalvalues-MeanSD-Mobility circuit class training-Social and education classes only-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to bias in measurement of outcome and missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

Outermans, 2010

Bibliographic Reference	Outermans, J. C.; van Peppen, R. P.; Wittink, H.; Takken, T.; Kwakkel, G.; Effects of a high-intensity task-oriented training on gait performance early after stroke: a pilot study; Clinical rehabilitation; 2010; vol. 24 (no. 11); 979-987

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Trial name / registration number	
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	

Study arms

High intensity circuit class training (N = 23)
High-intensity mobility CCT, workstations based on Dean 2000 with progressive target heart rate; 45-60 minutes, 3 times/week for 4 weeks in addition to 30 min/day usual care physiotherapy. Staff:participant ratio: not reported

Low intensity circuit class training (N = 21)
Low-intensity mobility CCT, based on motor control and balance, no progression of heart rate; 45-60 minutes, 3 times/week for 4 weeks in addition to 30 min/day usual care physiotherapy.

Outcomes

Study timepoints
- Baseline
- 4 week

Continuous outcomes

Outcome	High intensity circuit class training, Baseline, N = 23	High intensity circuit class training, 4 week, N = 22	Low intensity circuit class training, Baseline, N = 21	Low intensity circuit class training, 4 week, N = 21
Six minute walk test (meters) final values Mean (SD)	459.8 (145.8)	518.7 (165.2)	401 (131.5)	422.4 (127.9)

Outcome	High intensity circuit class training, Baseline, N = 23	High intensity circuit class training, 4 week, N = 22	Low intensity circuit class training, Baseline, N = 21	Low intensity circuit class training, 4 week, N = 21
Walking speed (10m walk test) (m/s) final values Mean (SD)	1.5 (0.5)	1.7 (0.5)	1.4 (0.5)	1.4 (0.4)
Measures of standing balance (Berg balance scale) 0-56 final values Mean (SD)	53 (3.3)	54.1 (3)	53.2 (2.3)	54.1 (1.7)

Six minute walk test - Polarity - Higher values are better
Walking speed (10m walk test) - Polarity - Higher values are better
Measures of standing balance (Berg balance scale) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	High intensity circuit class training, Baseline, N = 23	High intensity circuit class training, 4 week, N = 22	Low intensity circuit class training, Baseline, N = 21	Low intensity circuit class training, 4 week, N = 21
Adverse events No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Adverse events - Polarity - Lower values are better

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

Continuousoutcomes-Sixminutewalktest-MeanSD-High intensity circuit class training-Low intensity circuit class training-t4

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(due to bias in measurement of the outcome and deviation from intended intervention)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not state staff:pt ratio)*

Dichotomousoutcomes-Adverseevents-NoOfEvents-High intensity circuit class training-Low intensity circuit class training-t4

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(due to bias in measurement of the outcome and deviation from intended intervention)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not state staff:pt ratio)*

Continuousoutcomes-Measuresofstandingbalance(Bergbalancescale)-MeanSD-High intensity circuit class training-Low intensity circuit class training-t4

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(due to bias in measurement of the outcome and deviation from intended intervention)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not state staff:pt ratio)*

Continuousoutcomes-Walkingspeed(10mwalktest)-MeanSD-High intensity circuit class training-Low intensity circuit class training-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to bias in measurement of the outcome and deviation from intended intervention)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not state staff:pt ratio)*

Pang, 2005

Bibliographic Reference	Pang, M. Y.; Eng, J. J.; Dawson, A. S.; McKay, H. A.; Harris, J. E.; A community-based fitness and mobility exercise program for older adults with chronic stroke: a randomized, controlled trial; Journal of the American Geriatrics Society; 2005; vol. 53 (no. 10); 1667-1674

Study details

Secondary publication of another included study- see primary study for details	
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.

	Pang MY, Harris JE, Eng JJ. A community-based upper-extremity group exercise program improves motor function and performance of functional activities in chronic stroke: a randomized controlled trial. Arch Phys Med Rehabil. 2006 Jan;87(1):1-9. doi: 10.1016/j.apmr.2005.08.113. PMID: 16401430; PMCID: PMC3123334.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Study arms

Mobility-related circuit class training (N = 32)
mobility-related circuit class training based on FAME programme including warm-up, stretching, functional strengthening, balance, agility & fitness, cool down including target heart rate; 1-h session, 3 times/ week for 19 weeks. Staff:participant ratio = 3:9-12

Seated upper extremity program (N = 31)
Upper-limb-related exercise training including strengthening, range of motion, functional reach and manipulation tasks; 1-h session, 3 times/week for 19 weeks.

Outcomes

Study timepoints

- Baseline
- 19 week

continuous outcomes

Outcome	Mobility-related circuit class training, Baseline, N = 32	Mobility-related circuit class training, 19 week, N = 32	Seated upper extremity program, Baseline, N = 31	Seated upper extremity program, 19 week, N = 31
6 minute walk test - final value (meters) Mean (SD)	328.1 (143.5)	392.7 (151.1)	304.1 (123.8)	342.4 (133.4)
Measures of standing balance (Berg balance scale) final value 0-56 Mean (SD)	47.6 (6.7)	49.6 (4.4)	47.3 (6.1)	49.2 (5.8)
Measures of motor impairment (paretic leg muscle strength) final value (Newtons) Mean (SD)	182.6 (74.3)	223.2 (99.9)	194.9 (68.8)	205.3 (79.4)

6 minute walk test - final value - Polarity - Higher values are better
Measures of standing balance (Berg balance scale) final value - Polarity - Higher values are better
Measures of motor impairment (paretic leg muscle strength) final value - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Mobility-related circuit class training, Baseline, N = 32	Mobility-related circuit class training, 19 week, N = 32	Seated upper extremity program, Baseline, N = 31	Seated upper extremity program, 19 week, N = 31
adverse events (falls) No of events	n = 0 ; % = 0	n = 4 ; % = 12.5	n = 0 ; % = 0	n = 1 ; % = 3.2

adverse events (falls) - Polarity - Lower values are better

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

continuousoutcomes-6minutewalktest-finalvalue-MeanSD-Mobility-related circuit class training-Seated upper extremity program-t19

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

continuousoutcomes-Measuresofstandingbalance(Bergbalancescale)finalvalue-MeanSD-Mobility-related circuit class training-Seated upper extremity program-t19

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

continuousoutcomes-Measuresofmotorimpairment(pareticlegmusclestrength)finalvalue-MeanSD-Mobility-related circuit class training-Seated upper extremity program-t19

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

Dichotomousoutcomes-adverseevents(falls)-NoOfEvents-Mobility-related circuit class training-Seated upper extremity program-t19

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(Does not mention staff:pt ratio)*

Pang, 2006

Bibliographic Reference	Pang, M. Y.; Harris, J. E.; Eng, J. J.; A community-based upper-extremity group exercise program improves motor function and performance of functional activities in chronic stroke: a randomized controlled trial; Archives of physical medicine and rehabilitation; 2006; vol. 87 (no. 1); 1-9

Study details

Secondary publication of another included	

study- see primary study for details	
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review. Pang MY, Eng JJ, Dawson AS, McKay HA, Harris JE. A community-based fitness and mobility exercise program for older adults with chronic stroke: a randomized, controlled trial. J Am Geriatr Soc. 2005 Oct;53(10):1667-74. doi: 10.1111/j.1532-5415.2005.53521.x. PMID: 16181164; PMCID: PMC3226792.

Qurat ul, 2018

Bibliographic Reference	Qurat ul, Ain; Malik, A. N.; Amjad, I.; Effect of circuit gait training vs traditional gait training on mobility performance in stroke; JPMA - Journal of the Pakistan Medical Association; 2018; vol. 68 (no. 3); 455-458

Study details

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

Other publications associated with this study included in review	Qurat-ul-Ain, Malik AN, Haq U, Ali S. Effect of task specific circuit training on Gait parameters and mobility in stroke survivors. Pak J Med Sci. 2018;34(5):1300-1303. doi: https://doi.org/10.12669/pjms.345.15006 See this study for full study details
Trial name / registration number	NR
Subgroup 1 - Time after stroke at the start of trial	Mixed
Subgroup 2 - Premorbid Modified Rankin scale	>2
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Study arms

Task specific circuit gait training (N = 18)
Eight work stations of different activities related to balance and gait were defined at each work stations. These activities included tandem walk, one leg standing, one leg standing on foam, walking on different surfaces, stair climbing, standing on balance board, walking on a set pattern on floor and moving through obstacles. Patient practiced each task on station for 4-5 minutes. Total time for the session was 40-50 minutes and continued four days a week over a period of six weeks. All work stations were supervised by therapist.

Traditional gait training (N = 18)
Traditional Gait Training Group (TGTG): Traditional gait training exercises were given to the control group for four days a week with session duration 40-50 minutes. This treatment was continued for a period of six weeks

Outcomes

Study timepoints
- Baseline
- 6 week

Continuous outcomes

Outcome	Task specific circuit gait training, Baseline, N = 18	Task specific circuit gait training, 6 week, N = 15	Traditional gait training, Baseline, N = 18	Traditional gait training, 6 week, N = 15
measures of standing balance (berg balance scale) final values 0-59 Mean (SD)	31.6 (6.62)	51 (6.39)	35.13 (9.28)	41.26 (8.89)

measures of standing balance (berg balance scale) final values - Polarity - Higher values are better

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

Continuousoutcomes-measuresofstandingbalance(bergbalancescale)finalvalues-MeanSD-Task specific circuit gait training-Traditional gait training-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to randomisation and missing data)*
Overall bias and Directness	Overall Directness	Partially applicable *(Does not report staff:pt ratio)*

Qurat ul, 2018

Bibliographic Reference	Qurat ul, Ain; Malik, A. N.; Haq, U.; Ali, S.; Effect of task specific circuit training on gait parameters and mobility in stroke survivors; Pakistan Journal of Medical Sciences; 2018; vol. 34 (no. 5); 1300-1303

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	Qurat-ul-Ain, Malik AN, Amjad I. Effect of circuit gait training vs traditional gait training on mobility performance in stroke. J Pak Med Assoc. 2018 Mar;68(3):455-458. PMID: 29540885.
Trial name / registration number	NR

Study type	Randomised controlled trial (RCT)
Study location	Pakistan
Study setting	
Study dates	01st Jan, 2016 to 31st Jul, 2016
Sources of funding	Grant Support & Financial Disclosures: None
Inclusion criteria	Stroke survivors of both gender, age between 30- 70 years, any type of stroke, meeting criterion score for Modified Rankin Scale (MRS Score: 2-4) and able to perform 10 second independent standing were included in the sample after signing informed consent.
Exclusion criteria	Patients having cognitive/communication problems, severe abnormal synergies, contractures, trauma and fractures were excluded during initial evaluation.
Recruitment / selection of participants	Sample of the study was comprised of 36 stroke patients and met the sample size used in previous studies.
Intervention(s)	Eight work stations of different activities related to balance and gait were defined at each work stations. These activities included tandem walk, one leg standing, one leg standing on foam, walking on different surfaces, stair climbing, standing on balance board, walking on a set pattern on floor and moving through obstacles. Patient practiced each task on station for 4-5 minutes. Total time for the session was 40-50 minutes and continued four days a week over a period of six weeks. All work stations were supervised by therapist.
Subgroup 1 - Time after stroke at the start of trial	Mixed
Subgroup 2 - Premorbid Modified Rankin scale	>2
Subgroup 3 - Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	
Population subgroups	NR
Comparator	Traditional Gait Training Group (TGTG): Traditional gait training exercises were given to the control group for four days a week with session duration 40-50 minutes. This treatment was continued for a period of six weeks
Number of participants	36
Duration of follow-up	6 weeks
Indirectness	NR
Additional comments	The study does not explicitly state the same size number per group. Study only states 'Sample of the study was comprised of 36 stroke patients and met the sample size used in previous studies. Out of 36 patients 30 patients could successfully complete six weeks of training and six patients were dropped out due to different reasons. Sample was equally distributed among the two groups.' Number of participants per group is based on the assumption that the sample was split 50/50 between the groups.

Study arms

Task specific circuit gait training (N = 18)
Eight work stations of different activities related to balance and gait were defined at each work stations. These activities included tandem walk, one leg standing, one leg standing on foam, walking on different surfaces, stair climbing, standing on balance board, walking on a set pattern on floor and moving through obstacles. Patient practiced each task on station for 4-5 minutes. Total time for the session was 40-50 minutes and continued four days a week over a period of six weeks. All work stations were supervised by therapist.

Traditional gait training (N = 18)
Traditional Gait Training Group (TGTG): Traditional gait training exercises were given to the control group for four days a week with session duration 40-50 minutes. This treatment was continued for a period of six weeks

Characteristics

Study-level characteristics

Characteristic	Study (N = 36)
% Female Nominal	46.7
Mean age (SD) Mean (SD)	54.1 (10.1)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Time after stroke Nominal	NR
Premorbid Modified Rankin scale Range	2 to 4
Severity	NR

Characteristic	Study (N = 36)
Nominal	

Outcomes

Study timepoints

- Baseline
- 6 week

Continuous outcomes

Outcome	Task specific circuit gait training, Baseline, N = 18	Task specific circuit gait training, 6 week, N = 15	Traditional gait training, Baseline, N = 18	Traditional gait training, 6 week, N = 15
Functional mobility measures (timed up and go) final value (seconds) Mean (SD)	26.01 (8.5)	16.57 (7.1)	29.51 (9.5)	26.22 (12.3)

Functional mobility measures (timed up and go) final value - Polarity - Lower values are better

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

Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)finalvalue-MeanSD-Task specific circuit gait training-Traditional gait training-t6

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(due to randmisation and missing data)*
Overall bias and Directness	Overall Directness	Partially applicable *(does not report staff:pt ratio)*

Song, 2015

Bibliographic Reference	Song, H. S.; Kim, J. Y.; Park, S. D.; The effect of class-based task-oriented circuit training on the self-satisfaction of patients with chronic stroke; Journal of physical therapy science; 2015; vol. 27 (no. 1); 127-129

Study details

Secondary publication of another included study- see primary study for details	Song HS, Kim JY, Park SD. Effect of the class and individual applications of task-oriented circuit training on gait ability in patients with chronic stroke. J Phys Ther Sci. 2015 Jan;27(1):187-9. doi: 10.1589/jpts.27.187. Epub 2015 Jan 9. PMID: 25642070; PMCID: PMC4305558.
Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.

Song, 2015

Bibliographic Reference	Song, H. S.; Kim, J. Y.; Park, S. D.; Effect of the class and individual applications of task-oriented circuit training on gait ability in patients with chronic stroke; Journal of physical therapy science; 2015; vol. 27 (no. 1); 187-189

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review. Song, H. S.; Kim, J. Y.; Park, S. D. (2015) The effect of class-based task-oriented circuit training on the self-satisfaction of patients with chronic stroke. Journal of physical therapy science 27(1): 127-129
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Population subgroups	No additional information.
Indirectness	Intervention indirectness: Does not provide the staff:participant ratio.

Study arms

Circuit class training (N = 11)
Mobility CCT, provided in circuit. 30 min/day, 3 times/week for 4 weeks. Inpatient rehabilitation. Staff:participant ratio: not specified.
Concomitant therapy: No additional information.

Any other intervention (mobility CCT provided individually and conventional therapy) (N = 19)
1 group (n=10) receiving mobility exercises, provided one-to-one. 1 group (n=9) receiving conventional therapy (not described).
Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class training (N = 11)	Any other intervention (mobility CCT provided individually and conventional therapy) (N = 19)
% Female Sample size	n = NR ; % = NR	n = NR ; % = NR
Mean age (SD) (years) Mean (SD)	62.78 (9.97)	61.82 (7.6)

Characteristic	Circuit class training (N = 11)	Any other intervention (mobility CCT provided individually and conventional therapy) (N = 19)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time after stroke (Months) Mean (SD)	36.67 (15.12)	29.26 (17.12)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (Post-intervention)

Continuous outcomes

Outcome	Circuit class training, Baseline, N = 11	Circuit class training, 4 week, N = 11	Any other intervention (mobility CCT provided individually and conventional therapy), Baseline, N = 19	Any other intervention (mobility CCT provided individually and conventional therapy), 4 week, N = 19
Walking speed (velocity) - Final values (m/s) Final values. Reports values in cm/s, but as the majority of evidence in this review is reported in m/s this was converted to m/s (this was also done in the Cochrane review). Mean (SD)	0.63 (0.22)	0.65 (0.25)	0.48 (0.22)	0.63 (0.3)

Walking speed (velocity) - Final values - Polarity - Higher values are better

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

Continuousoutcomes-Walkingspeed(velocity)-Finalvalues-MeanSD-Circuit class training-Any other intervention (mobility CCT provided individually and conventional therapy)-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Intervention indirectness: Does not report staff:participant ratio)*

Tang, 2014

Bibliographic Reference	Tang, A.; Eng, J. J.; Krassioukov, A. V.; Madden, K. M.; Mohammadi, A.; Tsang, M. Y.; Tsang, T. S.; Exercise-induced changes in cardiovascular function after stroke: a randomized controlled trial; International journal of stroke; 2014; vol. 9 (no. 7); 883-889

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Study type	Randomised controlled trial (RCT)
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)

Population subgroups	No additional information.
Indirectness	No additional information.

Study arms

Circuit class training (N = 25)
Mobility circuit class training. Aerobic training with target progressive heart rate using brisk walking, cycling, step ups, sit to stands. 60-min sessions 3 times/week for 6 months. Staff:participant ratio: 3:12. Concomitant therapy: No additional information.

Any other intervention (balance and stretching exercises) (N = 25)
Balance and flexibility non-aerobic, including balance exercise progressed to be challenging. 60-min sessions 3 times/week for 6 months. Staff:participant ratio: 3:12. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	**Circuit class training (N = 25)**	**Any other intervention (balance and stretching exercises) (N = 25)**
% Female Sample size	n = 11 ; % = 44	n = 10 ; % = 40
Mean age (SD) (years) Mean (SD)	65.9 (6.4)	66.9 (7.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Circuit class training (N = 25)	Any other intervention (balance and stretching exercises) (N = 25)
Comorbidities Number of chronic conditions Mean (SD)	4 (2.1)	4 (2.7)
Time after stroke (years) Mean (SD)	4.3 (2.9)	4 (3)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Mean (SD)	2 (2.6)	1 (1.5)

Outcomes

Study timepoints

- Baseline
- 6 month (Post-intervention)

Continuous outcome

Outcome	Circuit class training, Baseline, N = 25	Circuit class training, 6 month, N = 22	Any other intervention (balance and stretching exercises), Baseline, N = 25	Any other intervention (balance and stretching exercises), 6 month, N = 25
6-minute walk test - Final values (meters) Final values Mean (SD)	278.2 (128.5)	298.1 (134.2)	322.2 (142.4)	331.5 (149.2)

6-minute walk test - Final values - Polarity - Higher values are better

Dichotomous outcome

Outcome	Circuit class training, Baseline, N = 25	Circuit class training, 6 month, N = 25	Any other intervention (balance and stretching exercises), Baseline, N = 25	Any other intervention (balance and stretching exercises), 6 month, N = 25
Adverse events (falls) No of events	n = NA ; % = NA	n = 11 ; % = 44	n = NA ; % = NA	n = 9 ; % = 36

Adverse events (falls) - Polarity - Lower values are better

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

Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training-Any other intervention (balance and stretching exercises)-t6

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

Dichotomousoutcome-Adverseevents(falls)-NoOfEvents-Circuit class training-Any other intervention (balance and stretching exercises)-t6

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

Vahlberg, 2017

Bibliographic Reference	Vahlberg, B.; Cederholm, T.; Lindmark, B.; Zetterberg, L.; Hellstrom, K.; Short-term and long-term effects of a progressive resistance and balance exercise program in individuals with chronic stroke: a randomized controlled trial; Disability & Rehabilitation; 2017; vol. 39 (no. 16); 1615-1622

Study details

Secondary publication of	No additional information.

another included study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	NCT1161329.
Study type	Randomised controlled trial (RCT)
Study location	Sweden.
Study setting	Community-living individuals, follow up as outpatients.
Study dates	October 2009 to April 2011 (recruitment), follow up ended in July 2012.
Sources of funding	Supported by grants from the Medical Faculty at Uppsala University STROKE-Riksfőrbundet and the Uppsala County Council and municipality in Sweden.
Inclusion criteria	Verified stroke of any type within the previous 1-3 years; ability to walk a minimum of 10m and either a lack of outdoor walking for at least 5 days per week (Derived from the Physical Activity Scale for the Elderly), low fall-related self-efficacy (Falls Efficacy Scale-Swedish version (FES(S) <115 points); balance difficulties (Berg Balance Scale (BBS) no more than 52 points) or repeated falls within the past year.
Exclusion criteria	Cognitive deficits (Short Portable Mental Status Questionnaire <7 points); dementia diagnosis; severe communication problems (assessed through medical records or revealed during examination) or a systolic blood pressure >180mmHg.
Recruitment / selection of participants	People were identified and recruited by reviewing the Swedish national stroke discharge register (RIKS-stroke).
Intervention(s)	Circuit class therapy with education N=34 Circuit class training conducted twice weekly over a 3 month period. Included the following sessions: a warm-up that consisted of stationary cycling or walking (10 minutes), a circuit class (approximately 45 minutes) and a motivational session that included discussions about issues and personal goals that are related to physical activity (20 minutes). The

	exercises were retrieved from the high-intensity functional exercises program. The resistance exercises used were performed at a low (>15 repetitions) to moderate (10-15 repetitions) intensity and were intended to improve strength and muscular endurance. Motivational groups after each training session were used to complement the exercise program. This included discussions with a physiotherapist for 20 minutes about physical activity behaviour and risk factor modifications with targeted questions about the barriers and facilitators to physical activity. A follow-up that targeted the compliance of the one daily at-home exercise was also included. Concomitant therapy: No additional information.
Subgroup 1 - Time after stroke at the start of trial	Chronic (>6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Population subgroups	No additional information.
Comparator	Any other intervention (usual care) N=33 Continue with regular activities. Were not restricted from participating in ordinary physical activities and rehabilitation programs. Concomitant therapy: No additional information.

Number of participants	67
Duration of follow-up	15 months (follow up at 3 months/post-intervention, 6 months and 15 months).
Indirectness	Outcome indirectness - Adverse events included only withdrawal due to adverse events instead of any adverse events.
Additional comments	No additional information. Appears to be intention to treat.

Study arms

Circuit class therapy with education (N = 34)
Circuit class training conducted twice weekly over a 3 month period. Included the following sessions: a warm-up that consisted of stationary cycling or walking (10 minutes), a circuit class (approximately 45 minutes) and a motivational session that included discussions about issues and personal goals that are related to physical activity (20 minutes). The exercises were retrieved from the high-intensity functional exercises program. The resistance exercises used were performed at a low (>15 repetitions) to moderate (10-15 repetitions) intensity and were intended to improve strength and muscular endurance. Motivational groups after each training session were used to complement the exercise program. This included discussions with a physiotherapist for 20 minutes about physical activity behaviour and risk factor modifications with targeted questions about the barriers and facilitators to physical activity. A follow-up that targeted the compliance of the one daily at-home exercise was also included. Concomitant therapy: No additional information.

Any other intervention (usual care) (N = 33)
Continue with regular activities. Were not restricted from participating in ordinary physical activities and rehabilitation programs. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Circuit class therapy with education (N = 34)	Any other intervention (usual care) (N = 33)
% Female Sample size	n = 7 ; % = 20.5	n = 9 ; % = 27.3
Mean age (SD) (years) Mean (SD)	72.6 (5.5)	73.7 (5.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Charlson Comorbidity Index, 0-4 Sample size	n = NA ; % = NA	n = NA ; % = NA
0 () Sample size	n = 17 ; % = 50	n = 16 ; % = 49
1 () Sample size	n = 9 ; % = 26	n = 12 ; % = 37
2 () Sample size	n = 6 ; % = 18	n = 4 ; % = 12
3 () Sample size	n = 1 ; % = 3	n = 1 ; % = 3

Characteristic	Circuit class therapy with education (N = 34)	Any other intervention (usual care) (N = 33)
4 () Sample size	n = 1 ; % = 3	n = 0 ; % = 0
Time after stroke (Months) IQR	4	2
Time after stroke (Months) Median (IQR)	13 (NA to NA)	13 (NA to NA)
Premorbid Modified Rankin scale Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 month (Post-intervention)
- 15 month (Follow-up)

Continuous outcomes

Outcome	Circuit class therapy with education, Baseline, N = 34	Circuit class therapy with education, 3 month, N = 34	Circuit class therapy with education, 15 month, N = 34	Any other intervention (usual care), Baseline, N = 33	Any other intervention (usual care), 3 month, N = 33	Any other intervention (usual care), 15 month, N = 33
Person/participant generic health-related quality of life (EQ-5D) - Change scores Scale range: 0-1. Change scores. Mean (SD)	0.68 (0.26)	0.068 (0.27)	0.034 (0.28)	0.67 (0.26)	0.001 (0.28)	0.044 (0.3)
6-minute walk test - Change scores (meters) Change scores. Mean (SD)	328.2 (115)	33.5 (82)	-29 (114.2)	361.6 (98.4)	5.3 (47.8)	-0.5 (85.9)
Walking speed (10 metre walk test) - Change scores (m/s) Change scores. Mean (SD)	1 (0.35)	0.1 (0.23)	0.08 (0.37)	1.08 (0.3)	-0.02 (0.16)	0 (0.25)
Functional mobility measures (Short Physical Performance Test) - Change scores Scale range: 0-12. Change scores. Mean (SD)	8.2 (3)	1 (2.8)	1.3 (2.4)	8.5 (2.5)	0.15 (1.1)	0.7 (2.4)

Outcome	Circuit class therapy with education, Baseline, N = 34	Circuit class therapy with education, 3 month, N = 34	Circuit class therapy with education, 15 month, N = 34	Any other intervention (usual care), Baseline, N = 33	Any other intervention (usual care), 3 month, N = 33	Any other intervention (usual care), 15 month, N = 33
Measures of standing balance (Berg Balance Scale) - Change scores Scale range: 0-56. Change scores. Mean (SD)	47.9 (9.6)	4.1 (9.1)	1.3 (5.4)	49 (9.7)	-0.06 (2.8)	-0.6 (3.4)

Person/participant generic health-related quality of life (EQ-5D) - Change scores - Polarity - Higher values are better
6-minute walk test - Change scores - Polarity - Higher values are better
Walking speed (10 metre walk test) - Change scores - Polarity - Higher values are better
Functional mobility measures (Short Physical Performance Test) - Change scores - Polarity - Higher values are better
Measures of standing balance (Berg Balance Scale) - Change scores - Polarity - Higher values are better

Dichotomous outcome

Outcome	Circuit class therapy with education, Baseline, N = 34	Circuit class therapy with education, 3 month, N = 34	Circuit class therapy with education, 15 month, N = 34	Any other intervention (usual care), Baseline, N = 33	Any other intervention (usual care), 3 month, N = 33	Any other intervention (usual care), 15 month, N = 33
Adverse events (withdrawal due to adverse events) Intervention: at 3 months, 2 medical condition. At 6 months, additional 1 acute disease. Control group: none.	n = NA ; % = NA	n = 2 ; % = 5.9	n = 3 ; % = 8.8	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0

Outcome	Circuit class therapy with education, Baseline, N = 34	Circuit class therapy with education, 3 month, N = 34	Circuit class therapy with education, 15 month, N = 34	Any other intervention (usual care), Baseline, N = 33	Any other intervention (usual care), 3 month, N = 33	Any other intervention (usual care), 15 month, N = 33
No of events						

Adverse events (withdrawal due to adverse events) - Polarity - Lower values are better

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t3

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

Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t15

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t3

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

Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t15

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

Continuousoutcomes-Walkingspeed(10metrewalktest)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t3

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

Continuousoutcomes-Walkingspeed(10metrewalktest)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t15

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

Continuousoutcomes-Functionalmobilitymeasures(ShortPhysicalPerformanceTest)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t3

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

Continuousoutcomes-Functionalmobilitymeasures(ShortPhysicalPerformanceTest)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t15

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

Continuousoutcomes-Measuresofstandingbalance(BergBalanceScale)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t3

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

Continuousoutcomes-Measuresofstandingbalance(BergBalanceScale)-Changescores-MeanSD-Circuit class therapy with education-Any other intervention (usual care)-t15

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

Dichotomousoutcome-Adverseevents(withdrawalduetoadverseevents)-NoOfEvents-Circuit class therapy with education-Any other intervention (usual care)-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Only withdrawal due to adverse events reported rather than all adverse events)*

Dichotomousoutcome-Adverseevents(withdrawalduetoadverseevents)-NoOfEvents-Circuit class therapy with education-Any other intervention (usual care)-t15

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Only withdrawal due to adverse events reported rather than all adverse events)*

van de Port, 2012

Bibliographic Reference	van de Port, I. G.; Wevers, L. E.; Lindeman, E.; Kwakkel, G.; Effects of circuit training as alternative to usual physiotherapy after stroke: randomised controlled trial; BMJ (Clinical research ed.); 2012; vol. 344; e2672

Study details

Other publications associated with this study included in review	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear
Subgroup 3 - Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	

Study arms

Circuit training (N = 126)

Usual care (N = 124)

Outcomes

Study timepoints
- Baseline
- 12 week
- 24 week

continuous outcomes

Outcome	Circuit training, Baseline, N = 126	Circuit training, 12 week, N = 126	Circuit training, 24 week, N = 125	Usual care, Baseline, N = 124	Usual care, 12 week, N = 124	Usual care, 24 week, N = 117
6-minute walk test - final value (meters) Mean (SD)	339 (120)	412 (117)	416 (118)	306 (135)	354 (145)	366 (151)

Outcome	Circuit training, Baseline, N = 126	Circuit training, 12 week, N = 126	Circuit training, 24 week, N = 125	Usual care, Baseline, N = 124	Usual care, 12 week, N = 124	Usual care, 24 week, N = 117
walking speed (comfortable walk test) - final values (msec) Mean (SD)	0.9 (0.3)	1.1 (0.3)	1.1 (0.3)	0.8 (0.4)	0.89 (0.36)	0.94 (0.39)
Functional mobility measures (timed up and go) - final values (seconds) Mean (SD)	15 (10)	11 (7)	11 (8)	18 (19)	15 (16)	14.6 (13.79)
Measures of standing balance (Timed balance test) final value 0-5 Mean (SD)	3.65 (1.05)	4.06 (1.02)	3.82 (1.45)	3.46 (1.11)	3.74 (1.06)	3.36 (1.52)

6-minute walk test - final value - Polarity - Higher values are better
walking speed (comfortable walk test) - final values - Polarity - Higher values are better
Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
Measures of standing balance (Timed balance test) final value - Polarity - Higher values are better

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

continuousoutcomes-6-minutewalktest-finalvalue-MeanSD-Circuit training-Usual care-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-walkingspeed(comfortablewalktest)-finalvalues-MeanSD-Circuit training-Usual care-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit training-Usual care-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Measuresofstandingbalance(Timedbalancetest)finalvalue-MeanSD-Circuit training-Usual care-t12

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to randomisation)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-6-minutewalktest-finalvalue-MeanSD-Circuit training-Usual care-t24

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(adue to randomisation and missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-walkingspeed(comfortablewalktest)-finalvalues-MeanSD-Circuit training-Usual care-t24

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(adue to randomisation and missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit training-Usual care-t24

Section	**Question**	**Answer**
Overall bias and Directness	Risk of bias judgement	High *(adue to randomisation and missing data)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

continuousoutcomes-Measuresofstandingbalance(Timedbalancetest)finalvalue-MeanSD-Circuit training-Usual care-t24

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(adue to randomisation and missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

van de Port, 2009

Bibliographic Reference	van de Port, I. G.; Wevers, L.; Roelse, H.; van Kats, L.; Lindeman, E.; Kwakkel, G.; Cost-effectiveness of a structured progressive task-oriented circuit class training programme to enhance walking competency after stroke: the protocol of the FIT-Stroke trial; BMC neurology; 2009; vol. 9; 43

Study details

Secondary publication of another included study- see primary study for details	Study protocol of: van de Port IG, Wevers LE, Lindeman E, Kwakkel G. Effects of circuit training as alternative to usual physiotherapy after stroke: randomised controlled trial. BMJ. 2012 May 10;344:e2672. doi: 10.1136/bmj.e2672. PMID: 22577186; PMCID: PMC3349299.
Other publications associated with	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513.

this study included in review	DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.

Verma, 2011

Bibliographic Reference	Verma, R.; Arya, K. N.; Garg, R. K.; Singh, T.; Task-oriented circuit class training program with motor imagery for gait rehabilitation in poststroke patients: a randomized controlled trial; Topics in stroke rehabilitation; 2011; vol. 18suppl1; 620-632

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	This study was included in the Cochrane review that this review was based on: English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.
Subgroup 1 - Time after stroke at the start of trial	Subacute (7 days - 6 months)
Subgroup 2 - Premorbid Modified Rankin scale	Not stated/unclear

Subgroup 3 - Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Population subgroups	

Study arms

Mobility circuit class training (N = 15)
Workstations including balance, stair walking, turning, transfers, and speed walking plus mental imagery

Conventional lower limb therapy (N = 15)
Conventional lower limb therapy based on Bobath techniques

Outcomes

Study timepoints
- Baseline
- 2 week (post intervention)
- 6 week

continuous outcomes

Outcome	Mobility circuit class training, Baseline, N = 15	Mobility circuit class training, 2 week, N = 15	Mobility circuit class training, 6 week, N = 15	Conventional lower limb therapy, Baseline, N = 15	Conventional lower limb therapy, 2 week, N = 15	Conventional lower limb therapy, 6 week, N = 15
6 minute walk test - final values (meters) Mean (SD)	115.2 (43.3)	199.2 (17.12)	202.9 (16.64)	96.67 (64)	111.7 (61.62)	127.8 (57.65)
Walking speed (comfortable walking speed) (m/s) Mean (SD)	0.41 (0.08)	0.58 (0.14)	0.62 (0.14)	0.35 (0.14)	0.43 (0.14)	0.45 (0.15)
Functional mobility measures (Functional Ambulation Classification) - final values 0-5 Mean (SD)	NR (NR)	7 (17)	NR (NR)	NR (NR)	2 (15)	NR (NR)
Activities of daily living (brthel index) final values 0-100 Mean (SD)	60 (9.82)	NR (NR)	90.67 (5.93)	53 (16.98)	NR (NR)	74.67 (15.52)

6 minute walk test - final values - Polarity - Higher values are better
Walking speed (comfortable walking speed) - Polarity - Higher values are better
Functional mobility measures (Functional Ambulation Classification) - final values - Polarity - Higher values are better
Activities of daily living (brthel index) final values - Polarity - Higher values are better

dichotomous outcomes

Outcome	Mobility circuit class training, Baseline, N = 15	Mobility circuit class training, 2 week, N = 15	Mobility circuit class training, 6 week, N = 15	Conventional lower limb therapy, Baseline, N = 15	Conventional lower limb therapy, 2 week, N = 15	Conventional lower limb therapy, 6 week, N = 15
adverse events (serious adverse events) The study participants experienced no serious adverse events during the trial No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

adverse events (serious adverse events) - Polarity - Lower values are better

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

dichotomousoutcomes-adverseevents(seriousadverseevents)-NoOfEvents-Mobility circuit class training-Conventional lower limb therapy-t2

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

dichotomousoutcomes-adverseevents(seriousadverseevents)-NoOfEvents-Mobility circuit class training-Conventional lower limb therapy-t6

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

continuousoutcomes-Activitiesofdailyliving(brthelindex)finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t2

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

continuousoutcomes-Activitiesofdailyliving(brthelindex)finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t6

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

continuousoutcomes-Functionalmobilitymeasures(FunctionalAmbulationClassification)-finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t2

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

continuousoutcomes-Functionalmobilitymeasures(FunctionalAmbulationClassification)-finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t6

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

continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t2

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

continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t6

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

continuousoutcomes-6minutewalktest-finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t2

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

continuousoutcomes-6minutewalktest-finalvalues-MeanSD-Mobility circuit class training-Conventional lower limb therapy-t6

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

Appendix E – Forest plots

E.1 Circuit class training compared to any other intervention

Figure 2: Person/participant generic health-related quality of life (SF-12 PCS, 0-100, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Dean 2012	0	9	65	2	9	68	-2.00 [-5.06, 1.06]

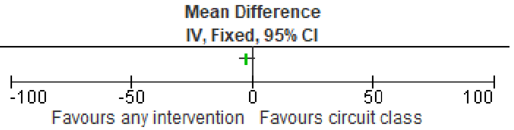


Figure 3: Person/participant generic health-related quality of life (SF-12 MCS, 0-100, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Dean 2012	0	11	65	0	12	68	0.00 [-3.91, 3.91]

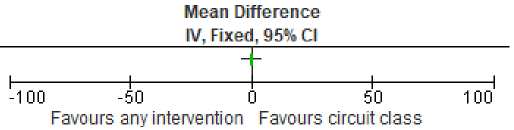


Figure 4: Person/participant generic health-related quality of life (AQOL, unclear range, higher values are better, final value) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
English 2015	0.22	0.38	93	0.22	0.44	190	0.00 [-0.10, 0.10]

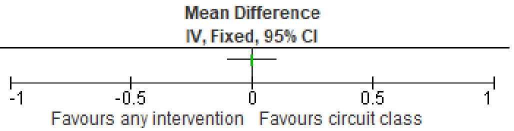


Figure 5: Person/participant generic health-related quality of life (EQ5D-5L, -0.11-1, higher values are better, final value) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Dean 2018	0.52	0.24	21	0.62	0.25	20	-0.10 [-0.25, 0.05]

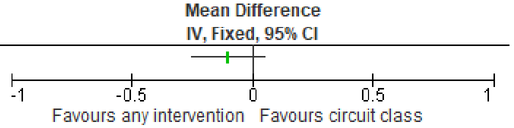


Figure 6: Six minute walk test ([meters] higher values are better, change scores and final values) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Random, 95% CI
Blennerhassett 2004	404	101	15	288	124	15	3.8%	116.00 [35.07, 196.93]
Dean 2000	250	135	5	264.3	159.1	4	0.8%	-14.30 [-210.03, 181.43]
Dean 2012	32	37.8	65	-2.5	50.5	68	16.1%	34.50 [19.38, 49.62]
English 2015	116	179	93	106.8	173	190	8.6%	9.20 [-34.72, 53.12]
Kim 2016	261	115.4	10	276	69.8	10	3.6%	-15.00 [-98.59, 68.59]
Kim 2017	103.33	82.62	15	42.07	36.09	15	8.2%	61.26 [15.63, 106.89]
Knox 2018	260	136	45	251.4	127.1	83	7.7%	8.60 [-39.63, 56.83]
Martins 2020	14	41	18	-4	27	18	14.0%	18.00 [-4.68, 40.68]
Moore 2015	512	131	20	441	126	20	3.9%	71.00 [-8.66, 150.66]
Mudge 2009	282	117	30	200	99	25	6.3%	82.00 [24.91, 139.09]
Pang 2005	392.7	151.1	32	342.4	133.4	31	4.7%	50.30 [-20.03, 120.63]
van de Port 2012	412	117	126	354	145	124	11.2%	58.00 [25.31, 90.69]
Verma 2011	199.2	17.12	15	111.7	61.62	15	11.3%	87.50 [55.14, 119.86]
Total (95% CI)			**489**			**618**	**100.0%**	**44.89 [27.26, 62.52]**

Heterogeneity: Tau² = 443.52; Chi² = 26.00, df = 12 (P = 0.01); I² = 54%
Test for overall effect: Z = 4.99 (P < 0.00001)

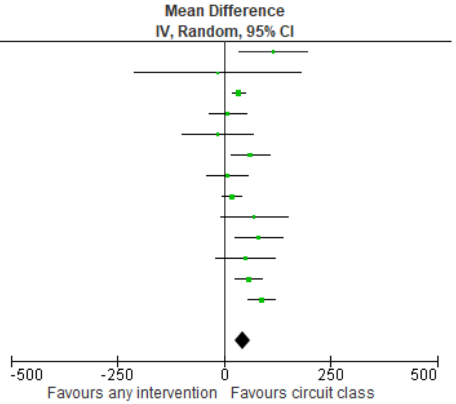


Figure 7: Six minute walk test ([meters], higher values are better, change scores and final values) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Random, 95% CI
Blennerhassett 2004	416	171	15	313	154	15	4.2%	103.00 [-13.46, 219.46]
Dean 2000	277.7	130.5	5	261.5	157.3	4	1.7%	16.20 [-175.76, 208.16]
Knox 2018	281	132	41	263.3	137.8	79	14.9%	17.70 [-32.86, 68.26]
Martins 2020	3	44	18	-9	57	18	22.3%	12.00 [-21.26, 45.26]
Mudge 2009	277	125	27	195	104	23	11.2%	82.00 [18.52, 145.48]
van de Port 2012	416	118	125	366	151	117	21.8%	50.00 [15.70, 84.30]
Verma 2011	202.9	16.64	15	127.8	57.65	15	23.8%	75.10 [44.73, 105.47]
Total (95% CI)			**246**			**271**	**100.0%**	**47.93 [22.37, 73.48]**

Heterogeneity: Tau² = 473.17; Chi² = 11.01, df = 6 (P = 0.09); I² = 46%
Test for overall effect: Z = 3.68 (P = 0.0002)

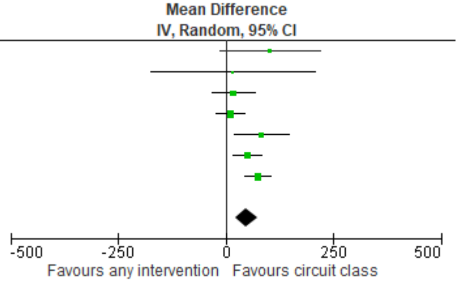


Figure 8: Walking speed (10 meter walk test, comfortable walk test, [m/s], higher values are better, change scores) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Random, 95% CI
Dean 2012	0.015	0.21	65	-0.054	0.184	68	58.4%	0.07 [0.00, 0.14]
Martins 2020	0.05	0.14	18	0.07	0.16	18	41.6%	-0.02 [-0.12, 0.08]
Total (95% CI)			**83**			**86**	**100.0%**	**0.03 [-0.05, 0.12]**

Heterogeneity: Tau² = 0.00; Chi² = 2.15, df = 1 (P = 0.14); I² = 53%
Test for overall effect: Z = 0.73 (P = 0.47)

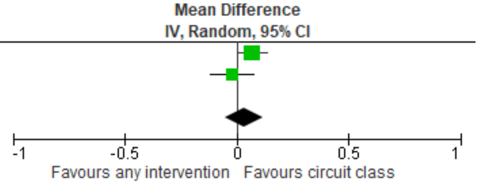


Figure 9: Walking speed (10 meter walk test, gait speed, comfortable walk test [m/s], higher values are better, final values) at post-intervention

	Circuit class			Any inverventions				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
Dean 2000	0.71	0.48	5	0.85	0.54	4	0.5%	-0.14 [-0.82, 0.54]
English 2015	0.48	0.6	93	0.45	0.61	190	9.6%	0.03 [-0.12, 0.18]
Knox 2018	0.75	0.36	45	0.53	0.28	83	14.6%	0.22 [0.10, 0.34]
Moore 2015	1.5	0.3	20	1.3	0.3	20	6.2%	0.20 [0.01, 0.39]
Mudge 2009	0.79	0.28	30	0.63	0.25	25	10.9%	0.16 [0.02, 0.30]
Song 2015	0.645	0.251	11	0.63	0.297	19	5.4%	0.02 [-0.18, 0.21]
van de Port 2012	1.1	0.3	126	0.89	0.36	124	31.7%	0.21 [0.13, 0.29]
Verma 2011	0.58	0.14	15	0.43	0.14	15	21.3%	0.15 [0.05, 0.25]
Total (95% CI)			**345**			**480**	**100.0%**	**0.16 [0.12, 0.21]**

Heterogeneity: Chi² = 8.24, df = 7 (P = 0.31); I² = 15%
Test for overall effect: Z = 6.92 (P < 0.00001)

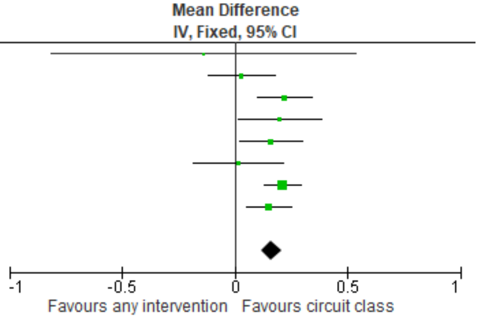


Figure 10: Walking speed (10 meter walk test, unclear units, higher values are better, final value) at post-intervention

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Ali 2020	36.18	8.53	11	35.27	5.47	11	0.91 [-5.08, 6.90]

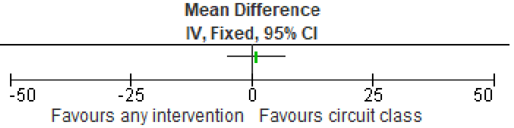


Figure 11: Walking speed (comfortable walking speed, [m/s], higher values are better, change score) at follow up

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Martins 2020	0.03	0.14	18	0.03	0.12	18	0.00 [-0.09, 0.09]

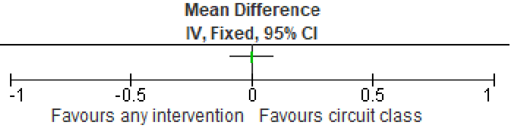


Figure 12: Walking speed (comfortable walk test, gait speed, [m/s], higher values are better, final values) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Fixed, 95% CI
Dean 2000	0.788	0.484	5	0.781	0.483	4	0.8%	0.01 [-0.63, 0.64]
Knox 2018	0.79	0.36	41	0.74	0.36	79	16.5%	0.05 [-0.09, 0.19]
Mudge 2009	0.77	0.26	27	0.63	0.25	23	15.2%	0.14 [-0.00, 0.28]
van de Port 2012	1.1	0.3	125	0.94	0.39	117	39.3%	0.16 [0.07, 0.25]
Verma 2011	0.62	0.14	15	0.45	0.15	15	28.3%	0.17 [0.07, 0.27]
Total (95% CI)			**213**			**238**	**100.0%**	**0.14 [0.09, 0.20]**

Heterogeneity: Chi² = 2.37, df = 4 (P = 0.67); I² = 0%
Test for overall effect: Z = 4.99 (P < 0.00001)

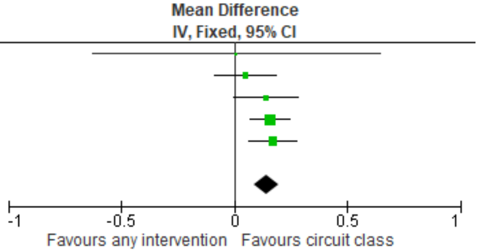


Figure 13: Functional mobility measures (timed up and go [seconds], lower values are better, change scores and final values) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Fixed, 95% CI
Blennerhassett 2004	11.5	3.8	15	19.1	14.4	15	5.8%	-7.60 [-15.14, -0.06]
Dean 2000	19.5	14.1	5	26.1	25.4	4	0.4%	-6.60 [-34.39, 21.19]
Dean 2012	4.2	27.1	65	-1.2	18.3	68	5.3%	5.40 [-2.49, 13.29]
Dean 2018	20.76	19.64	21	16.37	9.69	20	3.7%	4.39 [-5.02, 13.80]
Kang 2021	12.4	8.32	18	15.53	5.44	11	13.1%	-3.13 [-8.14, 1.88]
Kim 2017	-6.55	8.76	15	-5.27	5.25	15	12.3%	-1.28 [-6.45, 3.89]
Knox 2018	20.7	17.1	45	20.71	18.36	83	8.1%	-0.01 [-6.38, 6.36]
Marigold 2005	16.7	9.6	22	17	10.7	26	10.0%	-0.30 [-6.05, 5.45]
Qurat ul 2018	16.57	7.1	15	26.22	12.3	15	6.4%	-9.65 [-16.84, -2.46]
van de Port 2012	11	7	126	15	16	124	34.9%	-4.00 [-7.07, -0.93]
Total (95% CI)			**347**			**381**	**100.0%**	**-2.63 [-4.44, -0.82]**

Heterogeneity: Chi² = 13.87, df = 9 (P = 0.13); I² = 35%
Test for overall effect: Z = 2.84 (P = 0.004)

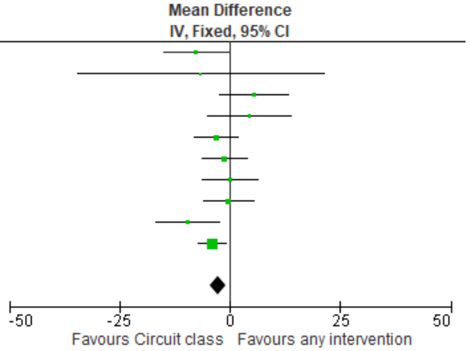


Figure 14: Functional mobility measures (Functional Ambulation Classification, FMA-LL [different scale ranges], higher values are better, final values) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Kim 2016	27.4	6.7	10	25.9	4.8	10	40.1%	0.25 [-0.63, 1.13]
Verma 2011	7	17	15	2	15	15	59.9%	0.30 [-0.42, 1.02]
Total (95% CI)			**25**			**25**	**100.0%**	**0.28 [-0.28, 0.84]**

Heterogeneity: Chi² = 0.01, df = 1 (P = 0.92); I² = 0%
Test for overall effect: Z = 0.99 (P = 0.32)

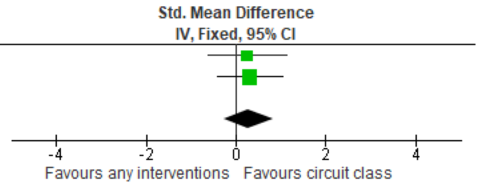


Figure 15: Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Mean Difference IV, Fixed, 95% CI
Blennerhassett 2004	10.8	4.5	15	21.3	30.3	15	2.2%	-10.50 [-26.00, 5.00]
Dean 2000	23.6	22.9	5	28.1	29.5	4	0.4%	-4.50 [-39.69, 30.69]
Dean 2018	20.76	19.25	21	15.95	12	20	5.4%	4.81 [-4.96, 14.58]
Knox 2018	17.6	12.2	41	21.2	18.7	79	16.7%	-3.60 [-9.16, 1.96]
Marigold 2005	16.9	10.5	19	17.5	11	23	12.2%	-0.60 [-7.12, 5.92]
van de Port 2012	11	8	125	14.6	13.79	117	63.1%	-3.60 [-6.47, -0.73]
Total (95% CI)			**226**			**258**	**100.0%**	**-2.93 [-5.21, -0.65]**

Heterogeneity: Chi² = 4.09, df = 5 (P = 0.54); I² = 0%
Test for overall effect: Z = 2.52 (P = 0.01)

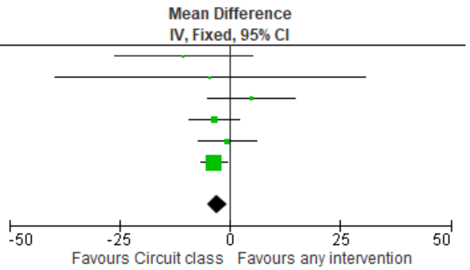


Figure 16: Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at post-intervention

	Circuit class			Any inverventions				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Ali 2020	40.91	1.22	11	40.55	5.16	11	5.0%	0.09 [-0.74, 0.93]
Kang 2021	50.65	7.22	18	47.18	6.27	11	5.8%	0.49 [-0.27, 1.25]
Kim 2016	46.7	9.4	10	49.8	4.6	10	4.5%	-0.40 [-1.29, 0.49]
Knox 2018	49	7	45	47.9	9.7	83	16.8%	0.12 [-0.24, 0.49]
Marigold 2005	49.1	5	22	48.1	5.7	26	9.3%	0.18 [-0.39, 0.75]
Moore 2015	55	2	20	52	5	20	7.7%	0.77 [0.13, 1.42]
Mudge 2009	7.36	1.9	30	6.42	1.7	25	10.1%	0.51 [-0.03, 1.05]
Pang 2005	49.6	4.4	32	49.2	5.8	31	11.5%	0.08 [-0.42, 0.57]
Qurat ul 2018	51	6.39	15	41.26	8.89	15	5.5%	1.22 [0.44, 2.01]
van de Port 2012	4.06	1.02	126	3.74	1.06	124	23.8%	0.31 [0.06, 0.56]
Total (95% CI)			**329**			**356**	**100.0%**	**0.31 [0.11, 0.51]**

Heterogeneity: Tau² = 0.03; Chi² = 12.65, df = 9 (P = 0.18); I² = 29%
Test for overall effect: Z = 3.06 (P = 0.002)

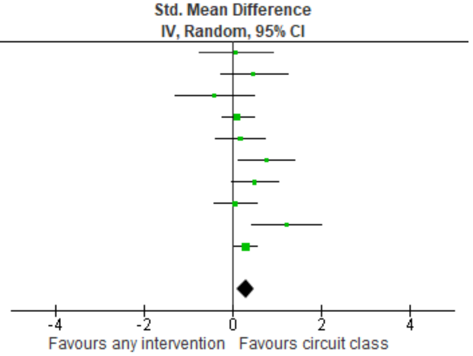


Figure 17: Measures of standing balance (step test [number of steps], higher values are better, change score and final value) at post-intervention

	Circuit class			Any inverventions				Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Dean 2000	9.8	4	5	5.8	4.3	4	23.9%	4.00 [-1.48, 9.48]
Dean 2012	0.4	2.8	65	0.2	3.2	68	76.1%	0.20 [-0.82, 1.22]
Total (95% CI)			**70**			**72**	**100.0%**	**1.11 [-2.07, 4.28]**

Heterogeneity: Tau² = 3.17; Chi² = 1.78, df = 1 (P = 0.18); I² = 44%
Test for overall effect: Z = 0.68 (P = 0.49)

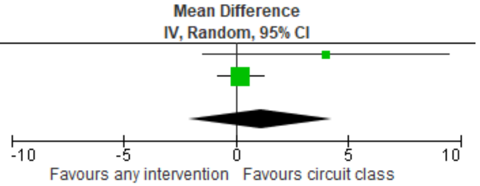


Figure 18: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change scores) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Kim 2017	6.6	6.58	15	5.27	5.25	15	1.33 [-2.93, 5.59]

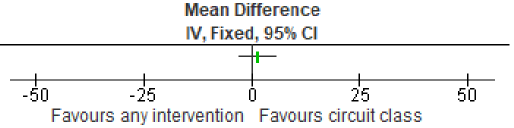


Figure 19: Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Knox 2018	50	6.7	41	49	9.2	79	24.7%	0.12 [-0.26, 0.50]
Marigold 2005	49	5.4	19	47.5	6	23	9.4%	0.26 [-0.35, 0.87]
Mudge 2009	7.12	2.1	27	6.62	1.7	23	11.3%	0.26 [-0.30, 0.81]
van de Port 2012	3.82	1.45	125	3.36	1.52	117	54.6%	0.31 [0.06, 0.56]
Total (95% CI)			**212**			**242**	**100.0%**	**0.25 [0.06, 0.44]**

Heterogeneity: $Chi^2 = 0.68$, df = 3 (P = 0.88); $I^2 = 0\%$
Test for overall effect: Z = 2.62 (P = 0.009)

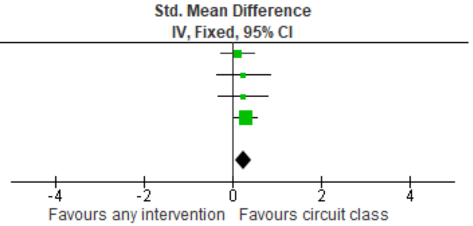


Figure 20: Measures of motor impairment (affected knee strength [kg], higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Dean 2012	0.4	7.7	64	0.1	6.9	66	0.30 [-2.22, 2.82]

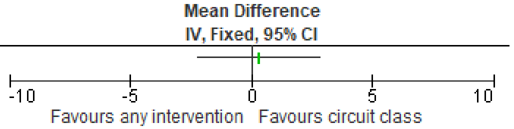


Figure 21: Measures of motor impairment (paretic leg muscle strength [newtons], higher values are better, final value) at post-intervention

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Pang 2005	223.2	99.9	32	205.3	79.4	31	17.90 [-26.59, 62.39]

Mean Difference
IV, Fixed, 95% CI

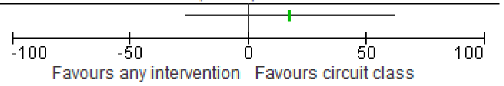


Figure 22: Measures of motor impairment (K-trunk impairment scale, 0-23, higher values are better, final value) at post-intervention

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Kang 2021	17.17	3.11	18	14.82	2.68	11	2.35 [0.21, 4.49]

Mean Difference
IV, Fixed, 95% CI

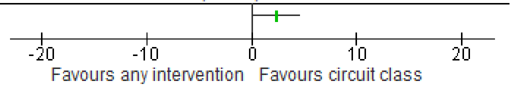


Figure 23: Activities of daily living (Barthel index, FIM [different scale ranges], higher are better, final values) at post-intervention

	Circuit class			Any inverventions				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
English 2015	93	35.8	93	98	34.8	190	92.6%	-0.14 [-0.39, 0.11]
Kim 2016	87	10.5	10	85.3	13.7	10	7.4%	0.13 [-0.74, 1.01]
Total (95% CI)			**103**			**200**	**100.0%**	**-0.12 [-0.36, 0.12]**

Heterogeneity: Chi² = 0.35, df = 1 (P = 0.55); I² = 0%
Test for overall effect: Z = 1.00 (P = 0.32)

Std. Mean Difference
IV, Fixed, 95% CI

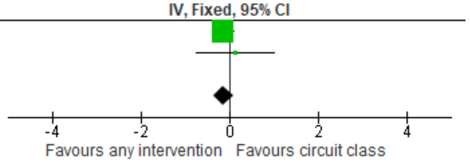


Figure 24: Activities of daily living (Barthel index, 0-100, higher are better, final value) at follow up

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Verma 2011	90.67	5.93	15	74.67	15.52	15	16.00 [7.59, 24.41]

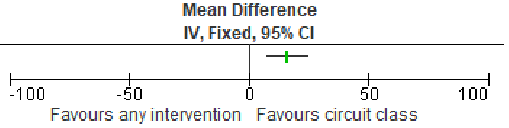


Figure 25: Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, change score) at post-intervention

	Circuit class			Any inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Martins 2020	9	14	18	-3	15	18	12.00 [2.52, 21.48]

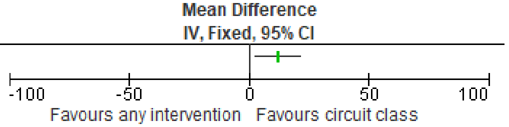


Figure 26: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - physical domain, different scale ranges, higher values are better, final values) at post-intervention

	Circuit class			Any inverventions				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI
English 2015	45.9	36.9	93	50	40.2	190	86.3%	-0.10 [-0.35, 0.14]
Moore 2015	324	96	20	348	64	20	13.7%	-0.29 [-0.91, 0.34]
Total (95% CI)			**113**			**210**	**100.0%**	**-0.13 [-0.36, 0.10]**

Heterogeneity: Chi² = 0.29, df = 1 (P = 0.59); I² = 0%
Test for overall effect: Z = 1.10 (P = 0.27)

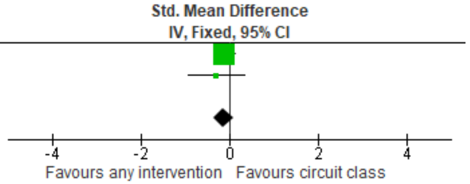


Figure 27: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - recovery score, 0-100, higher values are better, final value) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
English 2015	50	30	93	50	40	190	0.00 [-8.34, 8.34]

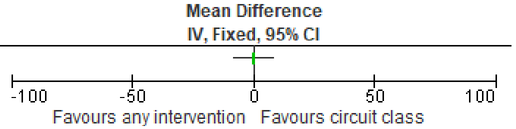


Figure 28: Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, final value) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Martins 2020	7	23	18	-9	18	18	16.00 [2.51, 29.49]

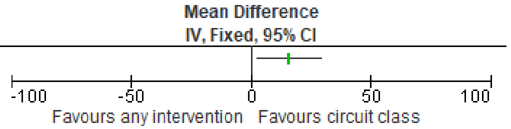


Figure 29: Stroke-specific Patient-Reported Outcome Measures (SSQOL, unclear scale range, higher values are better, final value) at follow up

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Any inverventions Mean	Any inverventions SD	Any inverventions Total	Mean Difference IV, Fixed, 95% CI
Dean 2018	3.38	0.7	21	3.63	0.82	20	-0.25 [-0.72, 0.22]

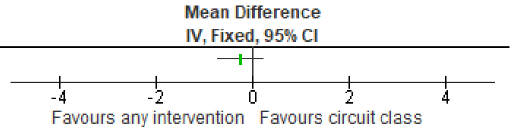


Figure 30: Length of hospital stay ([days], lower values are better, final value) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Other circuit class Mean	Other circuit class SD	Other circuit class Total	Mean Difference IV, Fixed, 95% CI
Blennerhassett 2004	40.7	28.1	15	67.5	43.1	15	-26.80 [-52.84, -0.76]

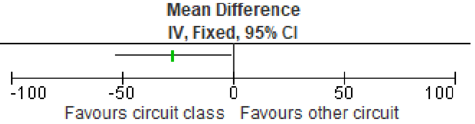


Figure 31: Adverse events at post-intervention

Study or Subgroup	Circuit class Events	Circuit class Total	Any inverventions Events	Any inverventions Total	Weight	Risk Difference M-H, Random, 95% CI
Dean 2012	0	76	0	75	26.7%	0.00 [-0.03, 0.03]
English 2015	21	93	28	190	14.5%	0.08 [-0.02, 0.18]
Kim 2016	0	10	0	10	7.1%	0.00 [-0.17, 0.17]
Martins 2020	0	18	0	18	14.0%	0.00 [-0.10, 0.10]
Moore 2015	0	20	0	20	15.4%	0.00 [-0.09, 0.09]
Pang 2005	4	32	1	31	10.6%	0.09 [-0.04, 0.22]
Verma 2011	0	15	0	15	11.7%	0.00 [-0.12, 0.12]
Total (95% CI)		**264**		**359**	**100.0%**	**0.02 [-0.03, 0.07]**
Total events	25		29			

Heterogeneity: Tau² = 0.00; Chi² = 14.26, df = 6 (P = 0.03); I² = 58%
Test for overall effect: Z = 0.77 (P = 0.44)

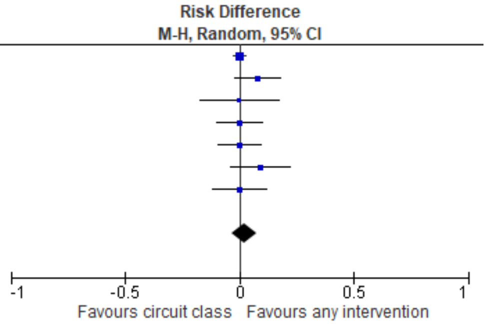
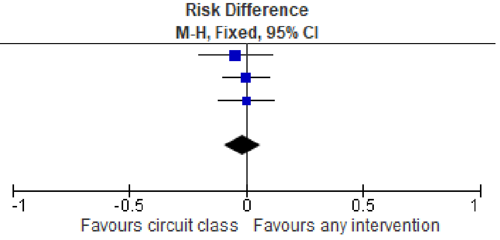


Figure 32: Adverse events at follow up

Study or Subgroup	Circuit class Events	Circuit class Total	Any inverventions Events	Any inverventions Total	Weight	Risk Difference M-H, Fixed, 95% CI
Dean 2018	19	21	19	20	38.3%	-0.05 [-0.20, 0.11]
Martins 2020	0	18	0	18	33.7%	0.00 [-0.10, 0.10]
Verma 2011	0	15	0	15	28.0%	0.00 [-0.12, 0.12]
Total (95% CI)		**54**		**53**	**100.0%**	**-0.02 [-0.10, 0.06]**
Total events	19		19			

Heterogeneity: Chi² = 0.31, df = 2 (P = 0.86); I² = 0%
Test for overall effect: Z = 0.43 (P = 0.67)



E.2 Circuit class training compared to other circuit class training

Figure 33: Six minute walk test ([meters], higher values are better, final values) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	Other circuit class Mean	Other circuit class SD	Other circuit class Total	Weight	Mean Difference IV, Random, 95% CI
Outermans 2010	518.7	165.2	22	422.4	127.9	21	49.1%	96.30 [8.22, 184.38]
Tang 2014	298.1	134.2	22	331.5	149.2	25	50.9%	-33.40 [-114.43, 47.63]
Total (95% CI)			**44**			**46**	**100.0%**	**30.25 [-96.83, 157.34]**

Heterogeneity: Tau² = 6546.79; Chi² = 4.51, df = 1 (P = 0.03); I² = 78%
Test for overall effect: Z = 0.47 (P = 0.64)

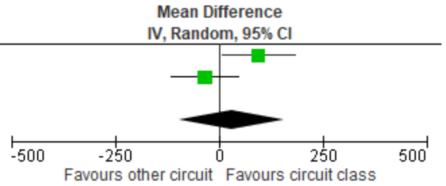


Figure 34: Walking speed (10m walk test [m/s], higher values are better, final values) at post-intervention

Study or Subgroup	Circuit class Mean	SD	Total	Other circuit class Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Outermans 2010	1.7	0.5	22	1.4	0.4	21	0.30 [0.03, 0.57]

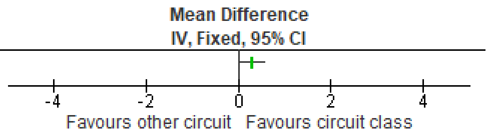


Figure 35: Measures of standing balance (Berg balance scale, 0-56, higher values are better, final value) at post-intervention

Study or Subgroup	Circuit class Mean	SD	Total	Other circuit class Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Outermans 2010	54.1	3	22	54.1	1.7	21	0.00 [-1.45, 1.45]

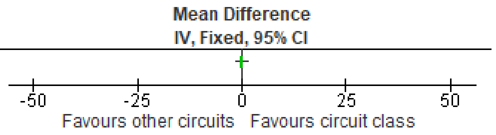
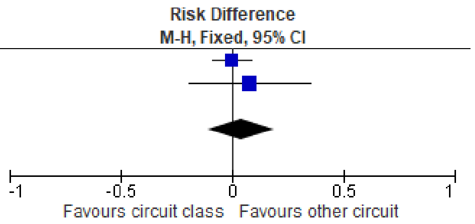


Figure 36: Adverse events at post-intervention

Study or Subgroup	Circuit class Events	Total	Other circuit class Events	Total	Weight	Risk Difference M-H, Fixed, 95% CI
Outermans 2010	0	22	0	21	46.2%	0.00 [-0.09, 0.09]
Tang 2014	11	25	9	25	53.8%	0.08 [-0.19, 0.35]
Total (95% CI)		**47**		**46**	**100.0%**	**0.04 [-0.11, 0.19]**
Total events	11		9			

Heterogeneity: Chi² = 1.03, df = 1 (P = 0.31); I² = 3%
Test for overall effect: Z = 0.56 (P = 0.58)



E.3 Circuit class training compared to no treatment

Figure 37: Six minute walk test ([meters], higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	23.6	49.5	12	5.3	25.8	13	18.30 [-13.02, 49.62]

Mean Difference
IV, Fixed, 95% CI

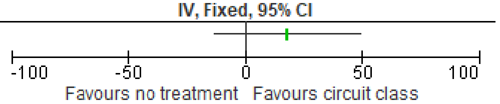


Figure 38: Functional mobility measures (timed up and go [seconds], lower values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	0.4	2.9	12	0.3	1.6	13	0.10 [-1.76, 1.96]

Mean Difference
IV, Fixed, 95% CI

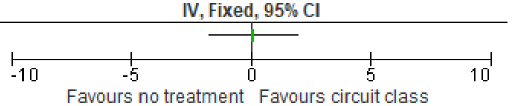


Figure 39: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - communication, 0-100, higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	21.1	23.4	12	-3.3	11.1	12	24.40 [9.75, 39.05]

Mean Difference
IV, Fixed, 95% CI

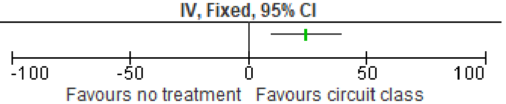


Figure 40: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - emotion, 0-100, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	No treatment Mean	No treatment SD	No treatment Total	Mean Difference IV, Fixed, 95% CI
Marsden 2010	9.7	12.3	12	2.6	11.9	13	7.10 [-2.40, 16.60]

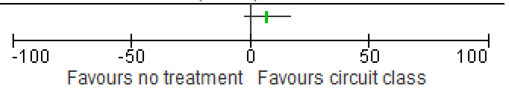


Figure 41: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - ADL, 0-100, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	No treatment Mean	No treatment SD	No treatment Total	Mean Difference IV, Fixed, 95% CI
Marsden 2010	2.9	10.1	12	-0.2	6.2	13	3.10 [-3.53, 9.73]

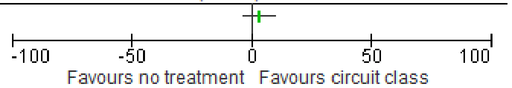


Figure 42: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - hand, 0-100, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class Mean	Circuit class SD	Circuit class Total	No treatment Mean	No treatment SD	No treatment Total	Mean Difference IV, Fixed, 95% CI
Marsden 2010	6.7	14	12	-1.2	9.4	13	7.90 [-1.53, 17.33]

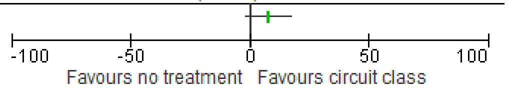


Figure 43: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - memory, 0-100, higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	-2.7	12.9	12	6	14.5	13	-8.70 [-19.44, 2.04]

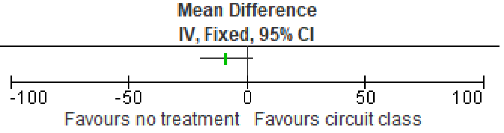


Figure 44: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - mobility, 0-100, higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	2.5	8.2	12	5.3	11.3	13	-2.80 [-10.50, 4.90]

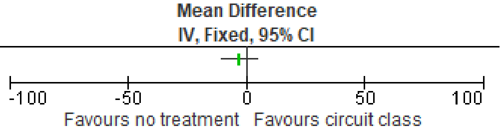


Figure 45: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - participation, 0-100, higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	3.6	18.6	12	3.4	16.5	13	0.20 [-13.63, 14.03]

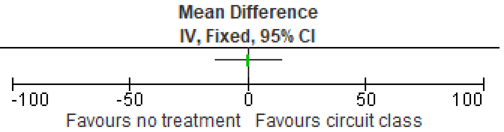
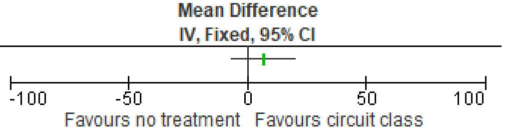


Figure 46: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - strength, 0-100, higher values are better, change score) at post-intervention

	Circuit class			No treatment			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Marsden 2010	3.1	21.1	12	-3.8	11	13	6.90 [-6.45, 20.25]



E.4 Circuit class training with education compared to any other intervention

Figure 47: Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	0.068	0.27	34	0.001	0.28	33	0.07 [-0.06, 0.20]

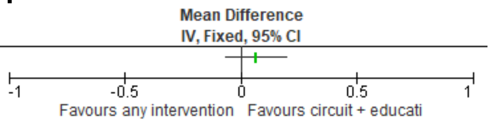


Figure 48: Person/participant generic health-related quality of life (SF-36 PCS, 0-100, higher values are better, final value) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Holmgren 2010	32.2	10.6	14	33.2	12	19	-1.00 [-8.74, 6.74]

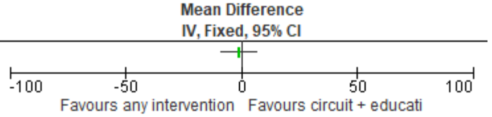


Figure 49: Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Holmgren 2010	54.4	10.3	14	54.8	10	19	-0.40 [-7.42, 6.62]

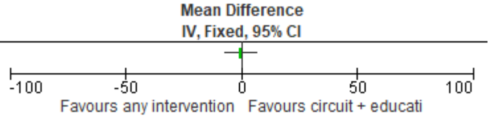


Figure 50: Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	0.034	0.28	34	0.044	0.3	33	-0.01 [-0.15, 0.13]

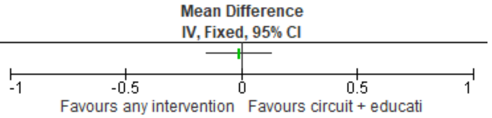


Figure 51: Person/participant generic health-related quality of life (SF-36 - PCS, 0-100, higher values are better, final value) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Holmgren 2010	35.3	13.3	13	35.4	12.9	18	-0.10 [-9.47, 9.27]

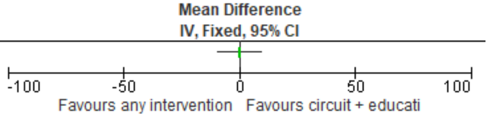


Figure 52: Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Holmgren 2010	50.4	15	13	55.4	9.3	18	-5.00 [-14.22, 4.22]

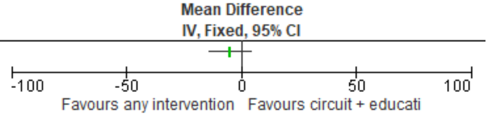


Figure 53: Six minute walk test ([meters], higher values are better, change score) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	33.5	82	34	5.3	47.8	33	28.20 [-3.83, 60.23]

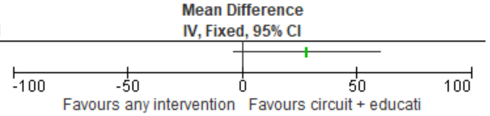


Figure 54: Six minute walk test ([meters], higher values are better, change score) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	-29	114.2	34	-0.5	85.9	33	-28.50 [-76.80, 19.80]

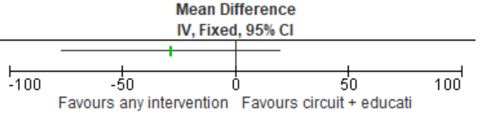


Figure 55: Walking speed (10m walk test [m/s], higher values are better, change score) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	0.1	0.23	34	-0.02	0.16	33	0.12 [0.03, 0.21]

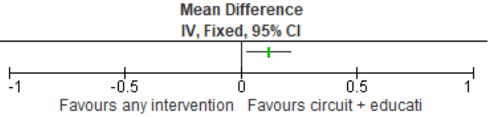


Figure 56: Walking speed (10m walk test [m/s], higher values are better, change score) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	1	2.8	34	0.15	1.1	33	0.85 [-0.16, 1.86]

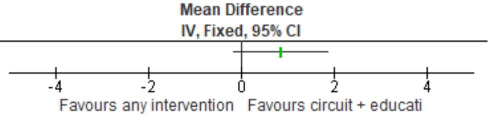


Figure 57: Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at post-intervention

Study or Subgroup	Circuit class + Education Mean	SD	Total	Other inverventions Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Vahlberg 2017	1	2.8	34	0.15	1.1	33	0.85 [-0.16, 1.86]

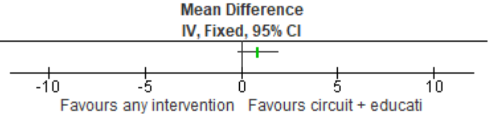


Figure 58: Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention

Study or Subgroup	Circuit class + Education Mean	SD	Total	Other inverventions Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Harrington 2010	17.4	7.5	119	16.4	7.5	124	1.00 [-0.89, 2.89]

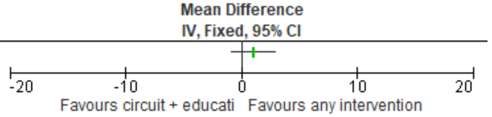


Figure 59: Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at follow up

Study or Subgroup	Circuit class + Education Mean	SD	Total	Other inverventions Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Vahlberg 2017	1.3	2.4	34	0.7	2.4	33	0.60 [-0.55, 1.75]

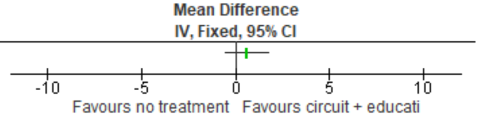


Figure 60: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	4.1	9.1	34	-0.06	2.8	33	4.16 [0.96, 7.36]

Mean Difference
IV, Fixed, 95% CI

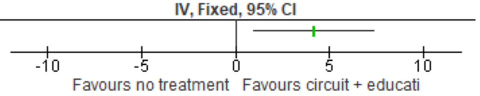


Figure 61: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at follow up

	Circuit class + Education			Other inverventions			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Vahlberg 2017	1.3	5.4	34	-0.6	3.4	33	1.90 [-0.25, 4.05]

Mean Difference
IV, Fixed, 95% CI

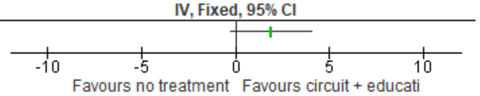


Figure 62: Adverse events (withdrawal due to adverse events) at post-intervention

	Favours circuit + educati		Other inverventions		Peto Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Peto, Fixed, 95% CI
Vahlberg 2017	2	34	0	33	7.40 [0.45, 120.82]

Peto Odds Ratio
Peto, Fixed, 95% CI

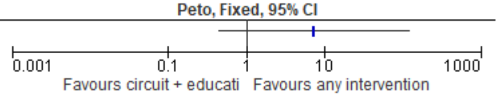
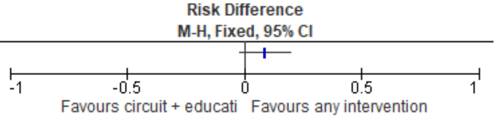


Figure 63: Adverse events (withdrawal due to adverse events) at follow up

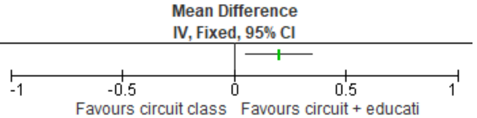
	Circuit class + Education		Other inverventions		Risk Difference
Study or Subgroup	Events	Total	Events	Total	M-H, Fixed, 95% CI
Vahlberg 2017	3	34	0	33	0.09 [-0.02, 0.20]



E.5 Circuit class training with education compared to circuit class training (without education)

Figure 64: Walking speed (gait speed [m/s], higher values are better, final value) at post-intervention

	Circuit class + education			Circuit class			Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI
Bovonsunthonchai 2020	0.78	0.21	20	0.58	0.27	20	0.20 [0.05, 0.35]



Appendix F – GRADE tables

Table 8: Clinical evidence profile: Circuit class therapy compared to any other intervention

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (SF-12 PCS, 0-100, higher values are better, change score) at post-intervention (follow-up: 12 months; Scale from: 0 to 100)												
1	randomised trials	serious[a]	not serious	serious[b]	serious[c]	none	65	68	-	MD **2 lower** (5.06 lower to 1.06 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-12 MCS, 0-100, higher values are better, change score) at post-intervention (follow-up: 12 months; Scale from: 0 to 100)												
1	randomised trials	serious[a]	not serious	serious[b]	very serious[c]	none	65	68	-	MD **0** (3.91 lower to 3.91 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (AQOL, unclear range, higher values are better, final value) at post-intervention (follow-up: 4 weeks)												
1	randomised trials	not serious	not serious	not serious	not serious	none	93	190	-	MD **0** (0.1 lower to 0.1 higher)	⨁⨁⨁⨁ High	CRITICAL
Person/participant generic health-related quality of life (EQ5D-5L, -0.11-1, higher values are better, final values) at follow up (follow-up: 9 months; Scale from: -0.11 to 1)												
1	randomised trials	very serious[d]	not serious	not serious	very serious[c]	none	21	20	-	MD **0.1 lower** (0.25 lower to 0.05 higher)	⨁◯◯◯ Very low	CRITICAL
Six minute walk test ([meters] higher values are better, change scores and final values) at post-intervention (follow-up: mean 15.6 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
13	randomised trials	serious[e]	serious[f]	not serious	serious[c]	none	489	618	-	MD **44.89 meters higher** (27.26 higher to 62.52 higher)	⊕◯◯◯ Very low	CRITICAL
Six minute walk test ([meters], higher values are better, change scores and final values) at follow up (follow-up: mean 16.4 weeks)												
7	randomised trials	serious[g]	serious[f]	not serious	serious[c]	none	246	271	-	MD **47.93 meters higher** (22.37 higher to 73.48 higher)	⊕◯◯◯ Very low	CRITICAL
Walking speed (10 meter walk test, comfortable walk test [m/s], higher values are better, change scores) at post-intervention (follow-up: mean 34 weeks)												
2	randomised trials	serious[a]	serious[f]	serious[b]	not serious	none	83	86	-	MD **0.03 m/s higher** (0.05 lower to 0.12 higher)	⊕◯◯◯ Very low	CRITICAL
Walking speed (10 meter walk test, gait speed, comfortable walk test [m/s], higher values are better, final values) at post-intervention (follow-up: mean 7.4)												
8	randomised trials	serious[h]	not serious	not serious	serious[c]	none	345	480	-	MD **0.16 m/s higher** (0.12 higher to 0.21 higher)	⊕⊕◯◯ Low	CRITICAL
Walking speed (10 meter walk test, unclear units, higher values are better, final values) at post-intervention (follow-up: mean 6 weeks)												
1	randomised trials	very serious[i]	not serious	not serious	very serious[c]	none	11	11	-	MD **0.91 higher** (5.08 lower to 6.9 higher)	⊕◯◯◯ Very low	CRITICAL
Walking speed (comfortable walking speed [m/s], higher values are better, change scores) at follow up (follow-up: 16 weeks)												
1	randomised trials	serious[g]	not serious	not serious	not serious	none	18	18	-	MD **0 m/s** (0.09 lower to 0.09 higher)	⊕⊕⊕◯ Moderate	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Walking speed (comfortable walk test, gait speed [m/s], higher values are better, final values) at follow up (follow-up: mean 14.8 weeks)												
5	randomised trials	very serious[i]	not serious	not serious	serious[c]	none	213	238	-	MD **0.14 m/s higher** (0.09 higher to 0.2 higher)	⊕◯◯◯ Very low	CRITICAL
Functional mobility measures (timed up and go [seconds], lower values are better, change scores and final values) at post-intervention (follow-up: mean 11.4 weeks)												
10	randomised trials	serious[e]	not serious	not serious	not serious	none	347	381	-	MD **2.63 seconds fewer** (4.44 fewer to 0.82 fewer)	⊕⊕⊕◯ Moderate	CRITICAL
Functional mobility measures (Functional Ambulation Classification, FMA-LL [different scale ranges], higher values are better, final values) at post-intervention (follow-up: mean 3 weeks)												
2	randomised trials	not serious	not serious	not serious	serious[c]	none	25	25	-	SMD **0.28 SD higher** (0.28 lower to 0.84 higher)	⊕⊕⊕◯ Moderate	CRITICAL
Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up (follow-up: mean 17.6 weeks)												
6	randomised trials	very serious[j]	not serious	not serious	not serious	none	226	258	-	MD **2.93 seconds lower** (5.21 lower to 0.65 lower)	⊕⊕◯◯ Low	CRITICAL
Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at post-intervention (follow-up: mean 11 weeks)												
10	randomised trials	serious[e]	not serious	not serious	not serious	none	329	356	-	SMD **0.3 SD higher** (0.15 higher to 0.45 higher)	⊕⊕⊕◯ Moderate	CRITICAL
Measures of standing balance (step test [number of steps], higher values are better, change score and final value) at post-intervention (follow-up: mean 28 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
2	randomised trials	serious[a]	not serious	serious[b]	very serious[c]	none	70	72	-	MD **1.11 steps higher** (2.07 lower to 4.28 higher)	⊕◯◯◯ Very low	CRITICAL
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention (follow-up: 4 weeks; Scale from: 0 to 56)												
1	randomised trials	very serious[k]	not serious	serious[b]	serious[c]	none	15	15	-	MD **1.33 higher** (2.93 lower to 5.59 higher)	⊕◯◯◯ Very low	CRITICAL
Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at follow up (follow-up: mean 18.5 weeks)												
4	randomised trials	very serious[j]	not serious	not serious	not serious	none	212	242	-	SMD **0.25 SD higher** (0.06 higher to 0.44 higher)	⊕⊕◯◯ Low	CRITICAL
Measures of motor impairment (affected knee strength [kg], higher values are better, change score) at post-intervention (follow-up: 12 months)												
1	randomised trials	serious[a]	not serious	serious[b]	not serious	none	64	66	-	MD **0.3 kg higher** (2.22 lower to 2.82 higher)	⊕⊕◯◯ Low	CRITICAL
Measures of motor impairment (paretic leg muscle strength [newtons], higher values are better, final value) at post-intervention (follow-up: 19 weeks)												
1	randomised trials	not serious	not serious	not serious	serious[c]	none	32	31	-	MD **17.9 Newtons higher** (26.59 lower to 62.39 higher)	⊕⊕⊕◯ Moderate	CRITICAL
Measures of motor impairment (K-trunk impairment scale, 0-23, higher values are better, final values) at post-intervention (follow-up: mean 8 weeks; Scale from: 0 to 23)												
1	randomised trials	very serious[e]	not serious	serious[b]	serious[c]	none	18	11	-	MD **2.35 higher** (0.21 higher to 4.49 higher)	⊕◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Activities of daily living (Barthel index, FIM [different scale ranges], higher are better, final values) at post-intervention (follow-up: mean 4 weeks)												
2	randomised trials	not serious	not serious	not serious	not serious	none	103	200	-	SMD **0.12 SD lower** (0.36 lower to 0.12 higher)	⨁⨁⨁⨁ High	CRITICAL
Activities of daily living (Barthel index, 0-100, higher are better, final value) at follow up (follow-up: 6 weeks; Scale from: 0 to 100)												
1	randomised trials	not serious	not serious	not serious	not serious	none	15	15	-	MD **16 higher** (7.59 higher to 24.41 higher)	⨁⨁⨁⨁ High	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, change score) at post-intervention (follow-up: 12 weeks; Scale from: 0 to 245)												
1	randomised trials	very serious[g]	not serious	not serious	serious[c]	none	18	18	-	MD **12 higher** (2.52 higher to 21.48 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - physical domain, different scale ranges, higher values are better, final values) at post-intervention (follow-up: mean 11.5 weeks)												
2	randomised trials	not serious	not serious	not serious	serious[c]	none	113	210	-	SMD **0.13 SD lower** (0.36 lower to 0.1 higher)	⨁⨁⨁◯ Moderate	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - recovery score, 0-100, higher values are better, final value) at post-intervention (follow-up: 4 weeks; Scale from: 0 to 100)												
1	randomised trials	not serious	not serious	not serious	not serious	none	93	190	-	MD **0** (8.34 lower to 8.34 higher)	⨁⨁⨁⨁ High	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, final value) at follow up (follow-up: 16 weeks; Scale from: 0 to 245)												
1	randomised trials	very serious[g]	not serious	not serious	serious[c]	none	18	18	-	MD **16 higher** (2.51 higher to 29.49 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Stroke-specific Patient-Reported Outcome Measures (SSQOL, unclear scale range, higher values are better, final value) at follow up (follow-up: 9 months)												
1	randomised trials	very serious[d]	not serious	not serious	serious[c]	none	21	20	-	MD **0.25 lower** (0.72 lower to 0.22 higher)	⨁◯◯◯ Very low	CRITICAL
Length of hospital stay ([days], lower values are better, final value) at post-intervention (follow-up: 4 weeks)												
1	randomised trials	not serious	not serious	not serious	serious[c]	none	15	15	-	MD **26.8 days fewer** (52.84 fewer to 0.76 fewer)	⨁⨁⨁◯ Moderate	CRITICAL
Adverse events at post-intervention (follow-up: mean 14.5 weeks)												
7	randomised trials	serious[e]	serious[l,m]	not serious	very serious[n]	none	36/264 (13.6%)	38/359 (10.6%)	**RD 0.02** (-0.03 to 0.07)	**20 more per 1,000** (from 30 fewer to 80 more)	⨁◯◯◯ Very low	CRITICAL
Adverse events at follow up (follow-up: mean 19 weeks)												
3	randomised trials	serious[h]	serious[m]	not serious	very serious[n]	none	19/54 (35.2%)	19/53 (35.8%)	**RD 0.02** (-0.10 to 0.06)	**20 more per 1,000** (from 100 fewer to 60 more)	⨁◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference; **SMD:** standardised mean difference

Explanations

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

b. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)

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

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

e. 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 deviation from the intended intervention, bias due to missing outcome data and bias in measurement of the outcome)

f. Downgraded by 1 increment because heterogeneity, unexplained by subgroup analysis

g. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to bias arising from the randomisation process and bias due to missing outcome data)

h. 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 deviation from the intended intervention and bias due to missing outcome data)

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

j. 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)

k. 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 in measurement of the outcome)

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

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

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

Table 9: Clinical evidence profile: Circuit class therapy compared to other types of circuit training

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training	other types of circuit training	Relative (95% CI)	Absolute (95% CI)		
Six minute walk test ([meters], higher values are better, final values) at post-intervention (follow-up: 4 weeks)												
2	randomised trials	very serious[a]	very serious[b]	not serious	very serious[c]	none	44	46	-	MD **30.25 meters higher** (96.83 lower to 157.34 higher)	⨁◯◯◯ Very low	CRITICAL
Walking speed (10m walk test [m/s], higher values are better, final value) at post-intervention (follow-up: 4 weeks)												
1	randomised trials	very serious[a]	not serious	serious[c]	serious[b]	none	22	21	-	MD **0.3 m/s higher** (0.03 higher to 0.57 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of standing balance (Berg balance scale, 0-56, higher values are better, final value) at post-intervention (follow-up: 4 weeks; Scale from: 0 to 56)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training	other types of circuit training	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[a]	not serious	serious[c]	not serious	none	22	21	-	MD **0** (1.45 lower to 1.45 higher)	⨁◯◯◯ Very low	CRITICAL
Adverse events at post-intervention (follow-up: 4 weeks)												
2	randomised trials	very serious[a]	not serious	not serious	very serious[e]	none	22/47 (23.4%)	9/46 (29.6%)	**RD 0.00** (-0.09 to 0.09)	**0 fewer per 1,000** (from 90 fewer to 90 more)[e]	⨁◯◯◯ Very low	CRITICAL

CI: confidence interval; **MD:** mean difference

Explanations

a. Downgraded by 1 increment as the majority of the evidence was of high risk of bias (due to a mixture of bias due to deviation from the intended intervention 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 due to intervention indirectness (does not state staff: participant ratio)

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

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

Table 10: Clinical evidence profile: Circuit class therapy compared to no treatment

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training	no treatment	Relative (95% CI)	Absolute (95% CI)		
Six minute walk test ([meters], higher values are better, change score) at post-intervention (follow-up: 9 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training	no treatment	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	13	-	MD **18.3 meters higher** (13.02 lower to 49.62 higher)	⨁◯◯◯ Very low	CRITICAL
Functional mobility measures (timed up and go [seconds], lower values are better, change score) at post-intervention (follow-up: 9 weeks)												
1	randomised trials	serious[a]	not serious	not serious	not serious	none	12	13	-	MD **0.1 seconds higher** (1.76 lower to 1.96 higher)	⨁⨁⨁◯ Moderate	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - communication, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	12	-	MD **24.4 higher** (9.75 higher to 39.05 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - emotion, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	13	-	MD **7.1 higher** (2.4 lower to 16.6 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - ADL, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	12	13	-	MD **3.1 higher** (3.53 lower to 9.73 higher)	⨁⨁◯◯ Low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - hand, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 months; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	12	13	-	MD **7.9 higher** (1.53 lower to 17.33 higher)	⨁⨁◯◯ Low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training	no treatment	Relative (95% CI)	Absolute (95% CI)		
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - memory, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	13	-	MD **8.7 lower** (19.44 lower to 2.04 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - mobility, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	13	-	MD **2.8 lower** (10.5 lower to 4.9 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - participation, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	12	13	-	MD **0.2 higher** (13.63 lower to 14.03 higher)	⨁◯◯◯ Very low	CRITICAL
Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - strength, 0-100, higher values are better, change score) at post-intervention (follow-up: 9 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	12	13	-	MD **6.9 higher** (6.45 lower to 20.25 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 and bias due to deviation from the intended intervention)

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

Table 11: Clinical evidence profile: Circuit class therapy with education compared to any other intervention

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training with education	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at post-intervention (follow-up: 3 months; Scale from: -0.11 to 1)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	34	33	-	MD **0.07 higher** (0.06 lower to 0.2 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 PCS, 0-100, higher values are better, final value) at post-intervention (follow-up: 5 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	serious[d]	very serious[b]	none	14	19	-	MD **1 lower** (8.74 lower to 6.74 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at post-intervention (follow-up: 5 weeks; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	serious[d]	very serious[b]	none	14	19	-	MD **0.4 lower** (7.42 lower to 6.62 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at follow up (follow-up: 15 months; Scale from: -0.11 to 1)												
1	randomised trials	very serious[a]	not serious	not serious	very serious[b]	none	34	33	-	MD **0.01 lower** (0.15 lower to 0.13 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 - PCS, 0-100, higher values are better, final value) at follow up (follow-up: 6 months; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	serious[d]	very serious[b]	none	13	18	-	MD **0.1 lower** (9.47 lower to 9.27 higher)	⨁◯◯◯ Very low	CRITICAL
Person/participant generic health-related quality of life (SF-36 - MCS, 0-100, higher values are better, final value) at follow up (follow-up: 6 months; Scale from: 0 to 100)												
1	randomised trials	very serious[c]	not serious	serious[d]	very serious[b]	none	13	18	-	MD **5 lower** (14.22 lower to 4.22 higher)	⨁◯◯◯ Very low	CRITICAL

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training with education	any other intervention	Relative (95% CI)	Absolute (95% CI)		
Six minute walk test ([meters], higher values are better, change score) at post-intervention (follow-up: 3 months)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **28.2 meters higher** (3.83 lower to 60.23 higher)	⨁◯◯◯ Very low	CRITICAL
Six minute walk test ([meters], higher values are better, change score) at follow up (follow-up: 15 months)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **28.5 meters lower** (76.8 lower to 19.8 higher)	⨁◯◯◯ Very low	CRITICAL
Walking speed (10m walk test [m/s], higher values are better, change score) at post-intervention (follow-up: 3 months)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **0.12 m/s higher** (0.03 higher to 0.21 higher)	⨁◯◯◯ Very low	CRITICAL
Walking speed (10m walk test [m/s], higher values are better, change score) at follow up (follow-up: 15 months)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **0.85 m/s higher** (0.16 lower to 1.86 higher)	⨁◯◯◯ Very low	CRITICAL
Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at post-intervention (follow-up: 3 months; Scale from: 0 to 12)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **0.85 higher** (0.16 lower to 1.86 higher)	⨁◯◯◯ Very low	CRITICAL
Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention (follow-up: 9 weeks)												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training with education	any other intervention	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	not serious	not serious	not serious	not serious	none	119	124	-	MD **1 higher** (0.89 lower to 2.89 higher)	⨁⨁⨁⨁ High	CRITICAL
Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at follow up (follow-up: 15 months; Scale from: 0 to 12)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **0.6 higher** (0.55 lower to 1.75 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention (follow-up: 3 months; Scale from: 0 to 56)												
1	randomised trials	very serious[a]	not serious	not serious	serious[b]	none	34	33	-	MD **4.16 higher** (0.96 higher to 7.36 higher)	⨁◯◯◯ Very low	CRITICAL
Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at follow up (follow-up: 15 months; Scale from: 0 to 56)												
1	randomised trials	very serious[a]	not serious	not serious	not serious	none	34	33	-	MD **1.9 higher** (0.25 lower to 4.05 higher)	⨁⨁◯◯ Low	CRITICAL
Adverse events (withdrawal due to adverse events) at post-intervention (follow-up: 3 months)												
1	randomised trials	very serious[a]	not serious	serious[e]	serious[f]	none	2/34 (5.9%)	0/33 (0.0%)	**RD 0.06** (-0.04 to 0.15)	**60 more per 1,000** (from 40 fewer to 150 more)[g]	⨁◯◯◯ Very low	CRITICAL
Adverse events (withdrawal due to adverse events) at follow up (follow-up: 15 months)												
1	randomised trials	very serious[a]	not serious	serious[e]	serious[f]	none	3/34 (8.8%)	0/33 (0.0%)	**RD 0.09** (-0.02 to 0.20)	**90 more per 1,000** (from 20 fewer to 200 more)[g]	⨁◯◯◯ 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 due to deviation from the intended intervention, bias due to missing outcome data 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 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 deviation from the intended intervention, and bias in selection of reported result)

d. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)

e. Downgraded by 1 increment due to outcome indirectness (reports withdrawal due to adverse events rather than all adverse events)

f. Downgraded by 1 increment for imprecision due to zero events and small sample size

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

Table 12: Clinical evidence profile: Circuit class therapy with education compared to circuit class training (without education)

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class training with education	circuit class training (without education)	Relative (95% CI)	Absolute (95% CI)		
Walking speed (gait speed [m/s], higher values are better, final value) at post-intervention (follow-up: 4 weeks)												
1	randomised trials	not serious	not serious	serious[a]	serious[b]	none	20	20	-	MD **0.2 m/s higher** (0.05 higher to 0.35 higher)	⨁⨁◯◯ Low	CRITICAL

CI: confidence interval; **MD:** mean difference

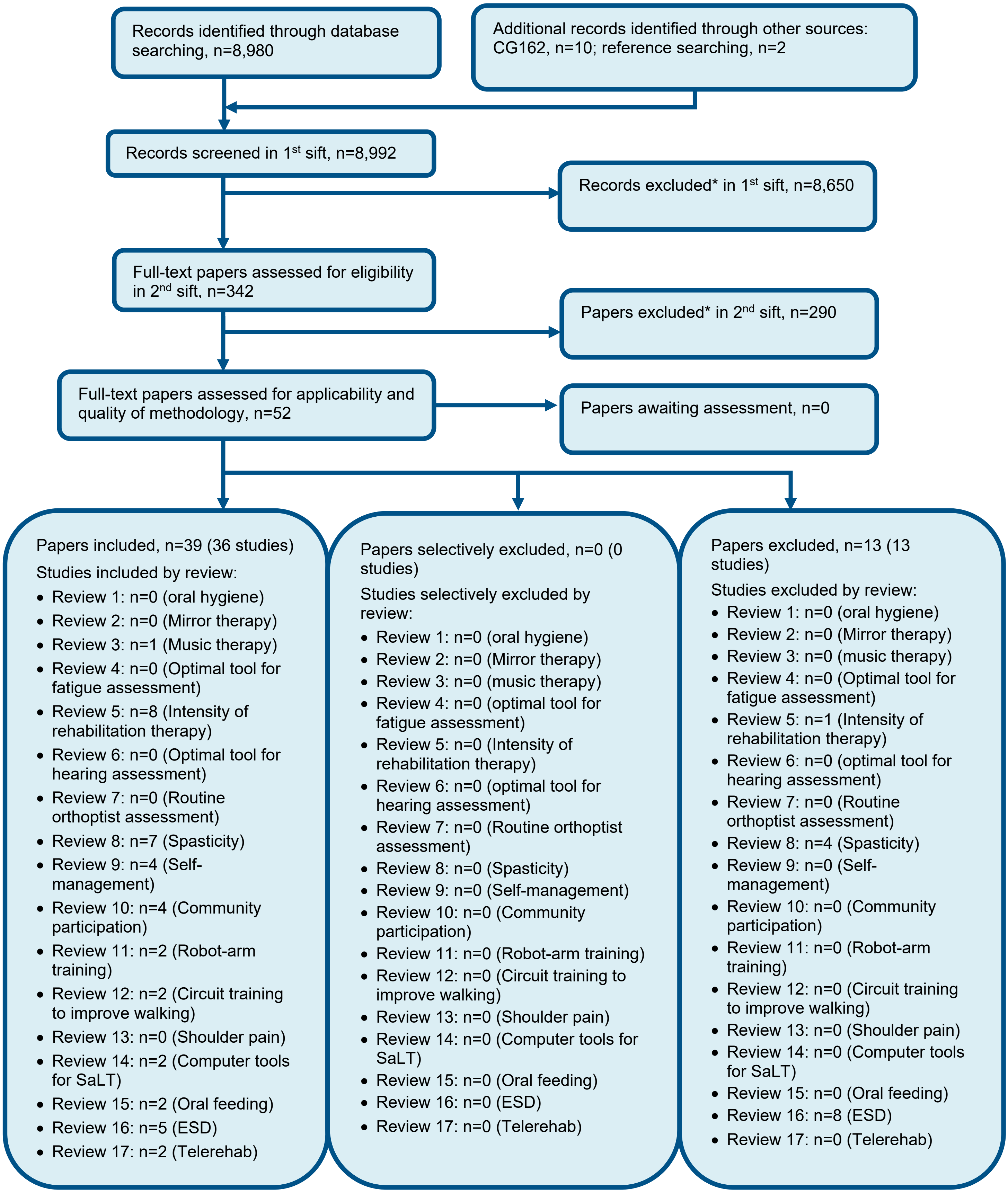
Explanations

a. Downgraded by 1 increment due to intervention indirectness (The staff ratio is not mentioned and the comparison group includes mental imagery as an extra treatment that is not available in both study arms.)

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

Appendix G – Economic evidence study selection

Figure 1: 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

H.1 Circuit class training compared to any other intervention

Study	**Dean 2018[8, 11]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: Cost-utility analysis (health outcome: QALYs) **Study design:** Within-RCT analysis (Dean 2018[8]). **Approach to analysis:** A micro-costing approach was adopted to estimate the intervention costs associated with the ReTrain program. 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	**Population:** Adults with stroke living in the community for at least 1 month since discharge, with self-reported difficulty with stairs, slopes or uneven surfaces. **Patient characteristics:** N = 45 Mean age (SD): 70.5 (11.1) years Male: 66% **Intervention 1:** Treatment as usual (n=22). This ranged from zero treatment to engagement with any health service(s). All participants were asked to not participate in additional physical rehabilitation (either NHS or private). All people received an advice booklet about exercise. **Intervention 2:** Circuit based training (ReTrain program) (n=23). Circuit class training	**Total costs (mean per patient):** Intervention 1: NR Intervention 2: NR Incremental (2−1): £777 (95%CI: NR, p=NR) **Currency & cost year:** 2016 UK pounds (£) **Cost components incorporated:** Staff time (trainers, administrator and facilitators), venue hire, training equipment (annualised over time), course materials, consumables and travel costs (participants, trainers and facilitators).	From the clinical review (2-1) – same paper: EQ-5D-5L (-0.11-1, higher values are better, final value) at follow up:[(b)] -0.10 (95% CI: -0.25 to 0.05, p=NR) QALY difference (2-1): -0.045[(c)]. Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up: 4.81 (95% CI: -4.96 to 14.58, P=NR) Other outcomes were reported and can be seen in clinical evidence table.	**ICER (Intervention 2 versus Intervention 1):** Dominated by usual care (higher costs and lower QALYs). Probability Intervention 2 is cost effective (£20K threshold): n/a **Analysis of uncertainty:** None.

considered relevant if the intervention is funded by the NHS. **Follow-up**: 9 months **Treatment effect duration:**[(a)] 9 months **Discounting:** n/a	delivered in a community setting (one gym, two church halls and one community centre) with twice-weekly 2-hour sessions over 3 months, comprising: an introductory one-to-one session (home visit); 10 twice-weekly group classes with up to 2 trainers and 8 clients (training venue); a closing one-to-one session (home visit); followed by 3 (one per month) drop-in sessions. Participants completed home-based training throughout.			
Data sources				
Health outcomes: Exploratory within-trial analysis of the ReTrain pilot RCT (same paper), where measures such as the Timed Up and Go Test and EQ-5D-5L scores were collected at baseline and 9-months post-randomisation. **Quality-of-life weights:** Within-RCT analysis: EQ-5D-5L (UK population valuation tariff). **Cost sources:** A micro-costing approach was used to calculate costs associated with ReTrain, which were generated for each cohort, accounting for different programme sizes (4-8 participants) and venues. The study mentions that instructors were specifically trained by the Action for Rehabilitation following Neurological Injury (ARNI) Trust, with course fees set at £649.[1] 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: Funded by the Stroke Association and the Peninsula Patient Involvement Group with the ReTrain Stroke Service User Group. The NIHR Collaboration for Leadership in Applied Health Research and Care South West Peninsula at the Royal Devon and Exeter NHS Foundation Trust also supported this work. **Limitations:** Mean EQ-5D-5L scores (UK tariff) at 9 months were used to calculate the cost per QALY gained for this review: the NICE reference case currently prefers EQ-5D-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. Pilot feasibility RCT (n=45) 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 costs from a single trial. The 9-month follow-up period may not capture full health effects of the intervention if these persist. Furthermore, cost sources were not reported, making it difficult to assess how the intervention compared to current practice: only the total intervention cost per participant was reported and it was unclear whether this included the training course fees (set at £649[1]) that instructors were required to complete before delivering the program, while other healthcare resource use was collected but not included. Sensitivity analysis was not performed on areas of uncertainty. **Other:** none.				
Overall applicability:[(d)] Partially applicable **Overall quality:**[(e)] Potentially serious limitations				

Abbreviations: 95% CI= 95% confidence interval; EQ-5D-5L= Euroqol 5 dimensions – 5 level version (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); ICER= incremental cost-effectiveness ratio; NR= not reported; QALYs= quality-adjusted life years;
(a) For studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.
(b) Mean difference taken from Appendix E.1 (Circuit class training compared to any other intervention– Forest plots). Rounded to one decimal place from -0.06 reported in the study.
(c) QALYs not reported but were estimated using 9-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

H.2 Circuit class training with education compared to any other intervention

Study	**Harrington 2010[11]**			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost effectiveness**
Economic analysis: Cost-consequence analysis (CC) (various health outcomes). **Study design:** Within-RCT analysis (Harrington 2010[11]). **Approach to analysis:** Analysis of individual-level healthcare resource use collected at baseline, 9 weeks and 6 months for both groups. Unit costs applied. **Perspective:** UK NHS and PSS **Follow up**: 12 months.	**Population:** Adults with stroke living in the community for at least three months. **Patient characteristics:** N = 243 Mean age: 70.5 years (SD: 10.3) Male: 54.3% **Intervention 1:** Standard care (n=124) plus an information sheet detailing local groups and contact numbers. Standard care differed according to the area where the participants lived: in five of the six Primary Care Trust areas covered a stroke coordinator contacted or visited stroke survivors approximately six weeks after	**Total costs (mean per patient):** Intervention 1: £2,994 Intervention 2: £3,741 Incremental (2−1): £746 (95%CI: –£432 to £1,924; p=NR) **Currency & cost year:** 2005 UK pounds (£) **Cost components incorporated:** NHS costs (primary care consultations, secondary care, community care and prescribed medication) and social care costs (home care, meals on wheels, use of a day centre and social	From the clinical review (2-1);[11] Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention: 1.00 (95% CI: -0.89 to 2.89)[(b)]	**ICER (Intervention 2 versus Intervention 1):** n/a Probability Intervention 2 is cost effective (£20K threshold): n/a **Analysis of uncertainty:** None.

Treatment effect duration:[(a)] 12 months **Discounting:** n/a	they returned home. In all areas stroke survivors were invited to a six-month review. **Intervention 2:** Community exercise and education scheme in addition to standard care (n=119) held twice weekly for eight weeks. Circuit class training was facilitated by volunteers and qualified exercise instructors (supported by a physiotherapist), each with nine participants plus carers or family members. Sessions were held in leisure and community centres and consisted of 1 hour of exercise followed by a short break, and 1 hour of interactive education.	worker time). See **Error! Reference source not found.** for cost breakdown between intervention groups.		
Data sources				
Health outcomes: Within-RCT analysis of a trial included in clinical review (Harrington 2010)[11] **Quality-of-life weights:** None. **Cost sources:** Within-trial analysis of resource use measured using a diary given to patients to note when they used any of the services identified. An assessor also visited who asked follow-up questions to gain more information about the nature of any contact. UK National Unit costs applied.				
Comments				
Source of funding: The Stroke Association, in partnership with the University of Bath and Age Concern Wiltshire, received funding from the Big Lottery. **Limitations:** EQ-5D and QALYs not used. 2005 UK resource use and unit costs may not reflect current UK NHS context. Within-trial analysis and so only reflects this study and not the wider evidence base identified in the clinical review. Unclear if follow-up (12 months) was sufficient to assess the full costs and benefits. Sensitivity analyses not performed. **Other:** The study reports outcomes relevant to the review as median and interquartile range values, that could not be used in the analysis of the clinical evidence and so were not extracted in the clinical review. In the circuit class training review, unpublished data was obtained from a Cochrane review for the outcome of the timed up and go test for this study that included mean and standard deviation values. This outcome was not relevant to the community participation review.				
Overall applicability:[(c)] Partially applicable **Overall quality:**[(d)] Potentially serious limitations				

Abbreviations: 95% CI= 95% confidence interval; EQ-5D= Euroqol 5 dimensions (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); ICER= incremental cost-effectiveness ratio; NR= not reported; QALYs= quality-adjusted life years; PSA = probabilistic sensitivity analyses.

(f) For studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.
(g) *Mean difference taken from Appendix E.4 (Circuit class training with education compared to any other intervention) of guideline clinical review.*
(h) Directly applicable / Partially applicable / Not applicable
(i) Minor limitations / Potentially serious limitations / Very serious limitations

Table 13: Cost breakdown from Harrington 2010[11]

	Mean (SD) cost per participant (£)		
	Control	**Intervention**	**Mean cost difference (95% CI) (£)**
Primary care	167 (158)	204 (172)	
Outpatient care	333 (469)	223 (338)	
Inpatient care	927 (2231)	1377 (3725)	
Community care	281 (410)	347 (660)	
Medication	313 (314)	265 (188)	
All NHS	2021 (2412)	2415 (4019)	
Social care	973 (2139)	1226 (1954)	
Intervention	0 (0)	99 (0)	
All NHS and PSS including cost of the intervention	2994 (3604)	3741 (4893)	746 (–432 to 1924)
Personal out-of-pocket costs (not included in the incremental results)	420 (969)	413 (843)	–7.62 (–260 to 245)

Abbreviation: PSS = Personal social services

Appendix I – Health economic model

Modelling was not prioritised for this question.

Appendix J – Excluded studies

Clinical studies

Table 14: Studies excluded from the clinical review

Study	Code [Reason]
(2018) The Effects of Task-Oriented Exercise Program on Balance Ability in Patients with Acute Stroke. J korean phys ther 30(4): 112-116	- Study not reported in English
Abbud, G. and Pearce, A. (2019) Implementing cardiovascular exercise training and education in a community setting to maximize long-term functional changes in subacute stroke-A feasibility study. International journal of stroke conferencecanadianstrokecongress2019canada14(3supplement): 29	- Conference abstract
Agni Priti, Nisheet and Kulkarni, Vivek (2017) EFFECT OF STRENGTH TRAINING, FUNCTIONAL TASK RELATED TRAINING AND COMBINED STRENGTH AND FUNCTIONAL TASK RELATED TRAINING ON UPPER EXTREMITY IN POST STROKE PATIENTS. 4(3): 184-190	- Study does not contain an intervention relevant to this review protocol
Aguiar, L. T., Nadeau, S., Martins, J. C. et al. (2020) Efficacy of interventions aimed at improving physical activity in individuals with stroke: a systematic review. Disability & Rehabilitation 42(7): 902-917	- Study does not contain an intervention relevant to this review protocol *Does not specifically look at circuit based exercises. References checked.*
Ahmed, U., Karimi, H., Amir, S. et al. (2021) Effects of intensive multiplanar trunk training coupled with dual-task exercises on balance, mobility, and fall risk in patients with stroke: a randomized controlled trial. Journal of international medical research 49(11): 3000605211059413	- Study does not contain an intervention relevant to this review protocol *Dual task training compared to standardised trunk care regime - does not appear to be circuit based exercises*
Amoros-Aguilar, L., Rodriguez-Quiroga, E., Sanchez-Santolaya, S. et al. (2021) Effects of Combined Interventions with Aerobic Physical Exercise and Cognitive Training on Cognitive Function in Stroke Patients: A Systematic Review. Brain Sciences 11(4): 08	- Systematic review used as source of primary studies

Study	Code [Reason]
Anandan, D., Tamil Nidhi, P. K., Arun, B. et al. (2020) Effect of task specific training with proprioceptive neuromuscular facilitation on stroke survivors. Biomedicine (India) 40(3): 363-366	- Study does not contain an intervention relevant to this review protocol *Does not mention circuit based training - does not appear to be group based, does not mention staffing ratio*
Arabzadeh, S., Goljaryan, S., Salahzadeh, Z. et al. (2018) Effects of a task-oriented exercise program on balance in patients with hemiplegia following stroke. Iranian Red Crescent Medical Journal 20(1)	- Study does not contain an intervention relevant to this review protocol *Task-oriented exercise but not clearly group based with no indication of the staff-to-client ratio being no more than one staff member per three clients.*
Best, J. R., Eng, J. J., Davis, J. C. et al. (2018) Study protocol for Vitality: a proof-of-concept randomised controlled trial of exercise training or complex mental and social activities to promote cognition in adults with chronic stroke. BMJ Open 8(3): e021490	- Protocol only
Bo, W., Lei, M., Tao, S. et al. (2019) Effects of combined intervention of physical exercise and cognitive training on cognitive function in stroke survivors with vascular cognitive impairment: a randomized controlled trial. Clinical Rehabilitation 33(1): 54-63	- Study does not contain an intervention relevant to this review protocol *Task-oriented exercise but not clearly group based with no indication of the staff-to-client ratio being no more than one staff member per three clients.*
Bonini-Rocha, A. C., de Andrade, A. L. S., Moraes, A. M. et al. (2018) Effectiveness of Circuit-Based Exercises on Gait Speed, Balance, and Functional Mobility in People Affected by Stroke: A Meta-Analysis. Pm & R 10(4): 398-409	- Study does not contain an intervention relevant to this review protocol *Different definition of circuit based exercise*

Study	Code [Reason]
	to that used in the English 2017 review and different from that used in our protocol. References checked.
Callister, R., Dunn, A., Marsden, D. et al. (2017) Improvements in fitness at 12-months follow up of an individualised home and community based exercise program after stroke. Journal of Science & Medicine in Sport 20: e22-e23	- Conference abstract
Cha, H. G. and Kim, M. K. (2017) Effects of strengthening exercise integrated repetitive transcranial magnetic stimulation on motor function recovery in subacute stroke patients: A randomized controlled trial. Technology & Health Care 25(3): 521-529	- Study does not contain an intervention relevant to this review protocol *Not circuit based training - not group based, no information about staffing ratio*
Church, G., Parker, J., Powell, L. et al. (2019) The effectiveness of group exercise for improving activity and participation in adult stroke survivors: a systematic review. Physiotherapy 105(4): 399-411	- Systematic review used as source of primary studies
de Sousa, D. G., Harvey, L. A., Dorsch, S. et al. (2018) Interventions involving repetitive practice improve strength after stroke: a systematic review. Journal of Physiotherapy 64(4): 210-221	- Systematic review used as source of primary studies
Deshpande, Shruti; Mohapatra, Sidhiparada; Girish, N. (2020) Influence of task-oriented circuit training on upper limb function among rural community-dwelling survivors of stroke. International Journal of Therapy & Rehabilitation 27(8): 1-8	- Study design not relevant to this review protocol *Single arm non-randomised study*
Diermayr, G., Schomberg, M., Greisberger, A. et al. (2020) Task-Oriented Circuit Training for Mobility in Outpatient Stroke Rehabilitation in Germany and Austria: A Contextual Transferability Analysis. Physical Therapy 100(8): 1307-1322	- Study design not relevant to this review protocol *Contextual transferability analysis*
Dunn, Ashlee, Marsden, Dianne L., Barker, Daniel et al. (2017) Cardiorespiratory fitness and walking endurance improvements after 12 months of an individualised home and community-based	- Study design not relevant to this review protocol

Study	Code [Reason]
exercise programme for people after stroke. Brain Injury 31(12): 1617-1624	*Single arm non-randomised study*
Dutra Barbosa, Diogo, Ruff Trojahn, Mirele, Gularte Porto, Daniela Veber et al. (2018) Strength training protocols in hemiparetic individuals post stroke: a systematic review. Fisioterapia em Movimento 31(1): 1-11	- Study does not contain an intervention relevant to this review protocol *Does not specifically look at circuit based training*
Ghous, M., Malik, A. N., Amjad, M. I. et al. (2017) Effects of activity repetition training with Salat (prayer) versus task oriented training on functional outcomes of stroke. JPMA - Journal of the Pakistan Medical Association 67(7): 1091-1093	- Study does not contain an intervention relevant to this review protocol *Not obviously circuit based - no mention of group based activity or staffing ratio*
Iqbal, M., Arsh, A., Hammad, S. M. et al. (2020) Comparison of dual task specific training and conventional physical therapy in ambulation of hemiplegic stroke patients: A randomized controlled trial. JPMA - Journal of the Pakistan Medical Association 70(1): 7-10	- Study does not contain an intervention relevant to this review protocol *Not obviously circuit based - no mention of group based activity or staffing ratio*
Johar, M. N.; Mohd Nordin, N. A.; Abdul Aziz, A. F. (2022) The effect of game-based in comparison to conventional circuit exercise on functions, motivation level, self-efficacy and quality of life among stroke survivors. Medicine 101(2): e28580	- Protocol only
Kelly, L. P., Devasahayam, A. J., Chaves, A. R. et al. (2021) Task-Oriented Circuit Training as an Alternative to Ergometer-Type Aerobic Exercise Training after Stroke. Journal of Clinical Medicine 10(11): 30	- No relevant outcomes *Outcomes were related to oxygen consumption, heart rate or biochemical measures*
Khallaf, M. E. (2020) Effect of Task-Specific Training on Trunk Control and Balance in Patients with Subacute Stroke. Neurology Research International 2020	- Study does not contain an intervention relevant to this review protocol

Study	Code [Reason]
Kim, K. H. and Jang, S. H. (2021) Effects of Task-Specific Training after Cognitive Sensorimotor Exercise on Proprioception, Spasticity, and Gait Speed in Stroke Patients: A Randomized Controlled Study. Medicina 57(10): 13	- Study does not contain an intervention relevant to this review protocol
Lim, C. (2019) Multi-Sensorimotor Training Improves Proprioception and Balance in Subacute Stroke Patients: A Randomized Controlled Pilot Trial. Frontiers in neurology [electronic resource]. 10: 157	- Study does not contain an intervention relevant to this review protocol
Liu, T. W.; Ng, G. Y. F.; Ng, S. S. M. (2018) Effectiveness of a combination of cognitive behavioral therapy and task-oriented balance training in reducing the fear of falling in patients with chronic stroke: study protocol for a randomized controlled trial. Trials [Electronic Resource] 19(1): 168	- Protocol only *Protocol for Lim 2019*
Moon, J. H., Park, K. Y., Kim, H. J. et al. (2018) The effects of task-oriented circuit training using rehabilitation tools on the upper-extremity functions and daily activities of patients with acute stroke: A randomized controlled pilot trial. Osong Public Health and Research Perspectives 9(5): 225-230	- Population not relevant to this review protocol *People with upper limb weakness rather than lower limb problems (intervention is focused on upper limb problems only)*
Nordin, N. A. M., Aziz, N. A., Sulong, S. et al. (2019) Effectiveness of home-based carer-assisted in comparison to hospital-based therapist-delivered therapy for people with stroke: A randomised controlled trial. NeuroRehabilitation 45(1): 87-97	- Data not reported in an extractable format or a format that can be analysed *Outcomes reported as median (interquartile range)*
Oh, S. J.; Lee, J. H.; Kim, D. H. (2019) The effects of functional action-observation training on gait function in patients with post-stroke hemiparesis: A randomized controlled trial. Technology & Health Care 27(2): 159-165	- Study does not contain an intervention relevant to this review protocol *Not circuit based exercise, not group based*
Pang, M. Y. C., Yang, L., Ouyang, H. et al. (2018) Dual-task exercise reduces cognitive-motor interference in walking and falls after stroke: A randomized controlled study. Stroke 49(12): 2990-2998	- Duplicate reference

Study	Code [Reason]
Pang, M. Y. C., Yang, L., Ouyang, H. et al. (2018) Dual-Task Exercise Reduces Cognitive-Motor Interference in Walking and Falls After Stroke. Stroke 49(12): 2990-2998	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit class training. Insufficient participant:staff ratio.*
Pogrebnoy, D. and Dennett, A. (2020) Exercise Programs Delivered According to Guidelines Improve Mobility in People With Stroke: A Systematic Review and Meta-analysis. Archives of Physical Medicine & Rehabilitation 101(1): 154-165	- Study does not contain an intervention relevant to this review protocol *Does not specifically investigate circuit based training*
Regan, Elizabeth W., Handlery, Reed, Liuzzo, Derek M. et al. (2019) The Neurological Exercise Training (NExT) program: A pilot study of a community exercise program for survivors of stroke. Disability and Health Journal 12(3): 528-532	- Study design not relevant to this review protocol *Single arm non-randomised study*
Reynolds, H., Steinfort, S., Tillyard, J. et al. (2021) Feasibility and adherence to moderate intensity cardiovascular fitness training following stroke: a pilot randomized controlled trial. BMC Neurology 21(1): 132	- Study does not contain an intervention relevant to this review protocol *Intervention does not appear to be circuit based (could be individual or group based)*
Rosenfeldt, A. B., Linder, S. M., Davidson, S. et al. (2019) Combined Aerobic Exercise and Task Practice Improve Health-Related Quality of Life Poststroke: a Preliminary Analysis. Archives of physical medicine and rehabilitation 100(5): 923-930	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit based training (intervention appears to be individual and supervised by a physiotherapist)*

Study	Code [Reason]
Salbach, N. (2017) Does participation in a group, task-oriented community-based exercise program improve the ability to do everyday activities among people with stroke?.	- Trial registry data only
SchrÖDer, Jonas, Truijen, Steven, Van Criekinge, Tamaya et al. (2019) FEASIBILITY AND EFFECTIVENESS OF REPETITIVE GAIT TRAINING EARLY AFTER STROKE: A SYSTEMATIC REVIEW AND META-ANALYSIS. Journal of Rehabilitation Medicine (Stiftelsen Rehabiliteringsinformation) 51(2): 78-88	- Study does not contain an intervention relevant to this review protocol *Does not appear to specifically investigate circuit based training*
Shen, Cuiling, Liu, Fang, Yao, Liqun et al. (2018) Effects of MOTOmed movement therapy on the mobility and activities of daily living of stroke patients with hemiplegia: a systematic review and meta-analysis. Clinical Rehabilitation 32(12): 1569-1580	- Study does not contain an intervention relevant to this review protocol *Not circuit based exercise*
Suchetha, P. S.; Supriya, B.; Krishna, Kovela Rakesh (2018) Effects of Modified Sit to Stand Training with Mental Practice on Balance and Gait in Post Stroke Patients. Indian Journal of Physiotherapy & Occupational Therapy 12(4): 16-21	- Study does not contain an intervention relevant to this review protocol *Not obviously circuit based - no mention of group based activity or staffing ratio*
Sun, Ruifeng, Li, Xiaoling, Zhu, Ziman et al. (2021) Effects of Combined Cognitive and Exercise Interventions on Poststroke Cognitive Function: A Systematic Review and Meta-Analysis. BioMed Research International: 1-11	- Study does not contain an intervention relevant to this review protocol *Does not specifically investigate circuit based training*
Sung-Jun, Moon and Tae-Ho, Kim (2017) Effect of three-dimensional spine stabilization exercise on trunk muscle strength and gait ability in chronic stroke patients: A randomized controlled trial. NeuroRehabilitation 41(1): 151-159	- Study does not contain an intervention relevant to this review protocol *Not circuit based therapy, not group based*

Study	Code [Reason]
Tetik Aydogdu, Y.; Aydogdu, O.; Inal, H. S. (2018) The Effects of Dual-Task Training on Patient Outcomes of Institutionalized Elderly Having Chronic Stroke. Dementia and geriatric cognitive disorders extra: 328-332	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit based training (no statement if completed in a group)*
Tramontano, M., Bergamini, E., Iosa, M. et al. (2018) Vestibular rehabilitation training in patients with subacute stroke: A preliminary randomized controlled trial. Neurorehabilitation 43(2): 247-254	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit based training (no statement if completed in a group)*
Tramontano, M., Dell'Uomo, D., Cinnera, A. M. et al. (2019) Visual-spatial training in patients with sub-acute stroke without neglect: A randomized, single-blind controlled trial. Functional Neurology 34(1): 7-13	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit based training (no statement if completed in a group)*
Traxler, K., Schinabeck, F., Baum, E. et al. (2021) Feasibility of a specific task-oriented training versus its combination with manual therapy on balance and mobility in people post stroke at the chronic stage: study protocol for a pilot randomised controlled trial. Pilot & Feasibility Studies 7(1): 146	- Study does not contain an intervention relevant to this review protocol *Does not appear to be circuit based training (no statement if completed in a group)*
Tshiswaka, Daudet Ilunga; Bennett, Crystal; Franklin, Cheyanne (2018) Effects of walking trainings on walking function among stroke survivors: a systematic review. International Journal of Rehabilitation Research 41(1): 1-13	- Study does not contain an intervention relevant to this review protocol *Systematic review that does not specifically investigate circuit based training*

Study	Code [Reason]
Van Criekinge, Tamaya, Truijen, Steven, Schröder, Jonas et al. (2019) The effectiveness of trunk training on trunk control, sitting and standing balance and mobility post-stroke: a systematic review and meta-analysis. Clinical Rehabilitation 33(6): 992-1002	- Study does not contain an intervention relevant to this review protocol *Does not specifically investigate circuit based training*
Van Wissen, K. and Blanchard, D. (2019) Circuit class therapy for improving mobility after stroke: A Cochrane review summary. International Journal of Nursing Studies 97: 130-131	- Study design not relevant to this review protocol *Summary of English 2017, the Cochrane review that this review is based on*
Varas Diaz, Gonzalo (2022) Effect of cognitive, impairment-oriented and task-specific interventions on balance and locomotion control. Dissertation Abstracts International: Section B: The Sciences and Engineering 83(2b): no pagination specified	- Thesis only
Wu, C. Y. (2017) Effects and mechanism of the sequential combination of exercise and cognitive training in stroke patients.	- Trial registry data only
Wu, C. Y., Yeh, T. T., Hu, Y. T. et al. (2018) The beneficial effects of sequential combination of cognitive training and aerobic exercise in stroke patients with cognitive decline. Stroke 49(suppl1)	- Conference abstract
Ziyal, Leyla (2018) Me before/me after: A group rehabilitation programme for brain injury survivors.	- Book only

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 15: Studies excluded from the health economic review

Reference	Reason for exclusion
None.	