

Stroke rehabilitation in adults (update)

[L] Evidence reviews for circuit training for walking

NICE guideline GID-NG10175

Evidence reviews underpinning recommendation 1.13.23 in the NICE guideline

April 2023

Draft for Consultation

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

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ISBN:

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1 Circuit training for walking

2 1.1 Review question

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

5 1.1.1 Introduction

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

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

20 1.1.2 Summary of the protocol

21 **Table 1: PICO characteristics of review question**

Population	<p>Inclusion:</p> <ul style="list-style-type: none">• Adults (age ≥ 16 years) who have had a first or recurrent stroke (including people after subarachnoid haemorrhage). <p>Exclusion:</p> <ul style="list-style-type: none">• Children (age < 16 years)• People who had a transient ischaemic attack
Intervention	<ul style="list-style-type: none">• Circuit class training<ul style="list-style-type: none">○ 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	<ul style="list-style-type: none">• Other types of circuit class training• Any other intervention, including:<ul style="list-style-type: none">○ Active interventions aiming at improving mobility/usual care (including individual therapy)• No treatment
Outcomes	<p>All outcomes are considered equally important for decision making and therefore have all been rated as critical:</p>

	<p>At time period:</p> <ul style="list-style-type: none">• 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<ul style="list-style-type: none">○ Timed Up and Go (continuous outcomes will be prioritised)○ Rivermead Mobility Index (continuous outcomes will be prioritised)• Measures of standing balance• Measures of motor impairment<ul style="list-style-type: none">○ 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)• 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	<ul style="list-style-type: none">• Systematic reviews of RCTs• Parallel RCTs <p>If insufficient RCT evidence is available, non-randomised studies will be considered, including:</p> <ol style="list-style-type: none">1. Prospective and retrospective cohort studies2. Case control studies (if no other evidence identified)

1 For full details see the review protocol in Appendix A.

2 **1.1.3 Methods and process**

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

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

7 **1.1.4 Effectiveness evidence**

8 **1.1.4.1 Included studies**

9 One systematic review¹¹ and in total twenty seven randomised controlled trial studies (thirty
10 four papers) were included in the review^{2, 4-24, 26-37} these are summarised in Table 2 below.
11 Evidence from these studies is summarised in the clinical evidence summary (section 1.1.6
12 Summary of the effectiveness evidence).

13 This review updated a published Cochrane review, English 2017¹¹. This review included
14 seventeen randomised controlled trials with a search conducted up to January 2017. In this
15 evidence review, an additional eleven randomised controlled trial studies were identified and

1 added to the review^{2, 5, 9, 15, 16, 18, 21, 22, 29, 30, 34}. This included one cross-over trial²⁰. The protocol
2 for this review originally specified that cross-over trials would be excluded. However, this
3 study was ultimately included to maintain consistency with the Cochrane review, which
4 stated that the first phase of cross-over trials could be considered for inclusion.

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

7 Circuit class training compared to:

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

11

12 Circuit class training with education compared to:

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

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

23 Circuit class training was generally offered alongside usual care and in some cases in
24 conjunction with a home-based programme that was given as homework. In the majority of
25 studies the intervention and control group treatments were matched for treatment time.
26 However, in some studies the control group were only provided with usual care or were not
27 provided with matched treatment time^{10, 12, 14, 15, 17, 24, 32, 34}.

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

34 Four studies^{5, 12, 14, 34} reported circuit class training with education. These involved
35 approximately 20 minutes to 1 hour of education usually prior to the circuit class training and
36 included the following topics: falls risk, health education, interactive self-management
37 education, discussions around physical activity and goal setting.

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

41 **Indirectness**

42 14 outcomes were downgraded for indirectness due to intervention or outcome indirectness.
43 In most cases this was due to the studies not stating the staff: participant ratio for the circuit
44 classes. The protocol, adapted from the included Cochrane review¹¹, only included studies
45 with a staff participant ratio of 1:3. Any studies which did not explicitly state the ratio or had a
46 greater staff ratio were downgraded for intervention indirectness. One study³⁴ reported
47 withdrawal due to adverse events rather than all adverse events and so outcomes including
48 this data were downgraded for outcome indirectness. One study was downgraded as it

1 compared circuit class training with education to the same circuit class training with mental
2 imagery instead⁵.

3 **Inconsistency**

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

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

9

10 **1.1.4.2 Excluded studies**

11 See the excluded studies list in Appendix J.

12 **1.1.5 Summary of studies included in the effectiveness evidence**

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

Study	Intervention and comparison	Population	Outcomes	Comments
Ali 2020 ²	<p>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.</p> <p>Any other intervention (n=11) The same program but completed as an individual with 1:1 supervision.</p> <p>Concomitant therapy: Not reported.</p>	<p>People after a first or recurrent stroke Mean age: 60.81 years N = 22</p> <p>Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	Walking speed at post-intervention Measures of standing balance at post-intervention	<p>Setting: Outpatient follow up in Pakistan.</p> <p>Sources of funding: Not reported.</p>

Study	Intervention and comparison	Population	Outcomes	Comments
Blennerhassett 2004 ⁴	<p>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.</p> <p>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.</p> <p>Concomitant therapy: Both groups received additional CCT therapy in addition to usual care</p>	<p>People after a first or recurrent stroke Mean age (SD): 55.1 (15.9) years N = 30</p> <p>Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>
Bovonsunthonchai 2020 ⁵	<p>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</p>	<p>People after a first or recurrent stroke Mean age (SD): 52.7 (11.5) years N = 40</p> <p>Mean time after stroke:</p>	<p>Walking speed at post-intervention</p>	<p>Setting: Outpatient follow up in three centres: the Physical Medicine and Rehabilitation Department, North Okkalapa General Hospital, East General Hospital</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>workstations and took place 3 times a week for 4 weeks.</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Mild (or NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear</p>		<p>and National Rehabilitation Hospital, Yangon, Myanmar in Thailand.</p> <p>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.</p>
Dean 2000 ⁶	<p>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</p> <p>Any other intervention (n=6) Upper limb-related CCT, workstations consisting of upper limb tasks; 1 h, 3 times/week for 4</p>	<p>People after a first or recurrent stroke Mean age (SD): 64.3 (7.4) years N = 12</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>weeks. Staff:participant ratio: 1:6.</p> <p>Concomitant therapy: No additional information.</p>			
<p>Dean 2012⁸</p> <p>Subsidiary study: Dean 2009⁷</p>	<p>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</p> <p>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</p> <p>Concomitant therapy: No additional information.</p>	<p>People after a first or recurrent stroke Mean age (SD): 67.1 (12.4) years N = 151</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>
<p>Dean 2018{ #4070}</p>	<p>Circuit class training (n=23) Circuit class training delivered in a community setting (one gym, two church halls and</p>	<p>People after a first or recurrent stroke Mean age (SD): 70.5 (11.1) years N = 45</p>	<p>Person/participant generic health-related quality of life at post-intervention and follow up Functional mobility measures</p>	<p>Setting: Community based in the United Kingdom.</p> <p>Sources of funding: Funded by the Stroke</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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.</p> <p>Participants completed home-based training throughout. Staff:participant ratio: 1:4</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>Mean time after stroke: Subacute (7 days - 6 months)</p> <p>Ethnicity: Not stated/unclear</p> <p>Severity: Not stated/unclear</p> <p>Premorbid Modified Rankin Scale: Mixed (majority 3)</p>	<p>at post-intervention and follow up</p> <p>Stroke-specific Patient-Reported Outcome Measures at post-intervention and follow up</p> <p>Adverse events at post-intervention and follow up</p>	<p>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.</p>
<p>English 2015¹⁰</p> <p>Subsidiary study: Hillier 2011¹³</p>	<p>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</p>	<p>People after a first or recurrent stroke Mean age (SD): 70.1 (12.9) years N = 283</p>	<p>Person/participant generic health-related quality of life at post-intervention</p> <p>Six minute walk test at post-intervention</p> <p>Walking speed at post-intervention</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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</p> <p>Staff:participant ratio: between 1:3 and 1:6.</p> <p>Any other intervention (n=190)</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>Mean time after stroke: Subacute (7 days - 6 months)</p> <p>Ethnicity: Not stated/unclear</p> <p>Severity: Not stated/unclear</p> <p>Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Activities of daily living at post-intervention</p> <p>Stroke-specific patient-report outcome</p> <p>measures post-intervention</p> <p>Length of hospital stay at post-intervention</p> <p>Adverse events at post-intervention</p>	
Harrington 2010 ¹²	<p>Circuit class training with education (n=119)</p> <p>CCT with exercises adapted to ability aimed at improving balance, strength and endurance, plus home exercise programme, plus interactive self-</p>	<p>People after a first or recurrent stroke</p> <p>Mean age (SD): 70.5 (10.4) years N = 243</p> <p>Mean time after stroke:</p>	<p>Functional mobility measures at post-intervention</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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</p> <p>Any other intervention (n=124) Standard care and information sheet with list of local exercise classes. Duration and frequency: not reported.</p> <p>Concomitant therapy: No additional information.</p>	<p>Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>		
Holmgren 2010 ¹⁴	<p>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.</p> <p>Any other intervention (education only) (n=19) Education about coping with hidden dysfunctions after stroke 1 h/week for 5 weeks.</p>	<p>People after a first or recurrent stroke Mean age (SD): 78.5 (7.6) years N = 34</p> <p>Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: >2</p>	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 ¹¹

Study	Intervention and comparison	Population	Outcomes	Comments
	Concomitant therapy: No additional information.			
Kang 2021 ¹⁵	<p>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.</p> <p>Any other intervention (n=15) Whole-body static stretching performed for 1 hour per class, twice a week for 8 weeks.</p> <p>Concomitant therapy: No additional information.</p>	<p>People after a first or recurrent stroke Mean age (SD): 54.8 (3.4) years N = 45</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Functional mobility measures at post-intervention Measures of standing balance at post-intervention Measures of motor impairment at post-intervention</p>	<p>Setting: People admitted to the sports center of N Hospital in Seoul, Republic of Korea.</p> <p>Sources of funding: This research was funded by a grant (#15-C-01) from the Korea National Rehabilitation Research Institute, Seoul, Republic of Korea.</p>
Kim 2016 ¹⁷	<p>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</p>	<p>People after a first or recurrent stroke Mean age (SD): 65.6 (6.2) years N = 20</p> <p>Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>Staff:participant ratio: at least 2 participants to 1 therapist</p> <p>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</p> <p>Concomitant therapy: No additional information.</p>	<p>Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>		
Kim 2017 ¹⁶	<p>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</p> <p>Any other intervention (n=15) Exercise focused on task-oriented exercise, such as strengthening exercise (resistance exercise), standing balance (using varying methods)</p>	<p>People after a first or recurrent stroke Mean age (SD): 55.7 (12.2) years N = 30</p> <p>Mean time after stroke: Subacute 7 days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Six minute walk test at post-intervention Function mobility measures post-intervention Measures of standing balance at post-intervention</p>	<p>Setting: Inpatients in the rehabilitation centres from South Korea.</p> <p>Sources of funding: No additional information.</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>and functional activities for gait improvement.</p> <p>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.</p>			
Knox 2018 ¹⁸	<p>Circuit class training (n=51)</p> <p>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.</p> <p>Staff:participant ratio: 1:4-6</p> <p>Any other intervention (n=93)</p> <p>Two groups combined for the review. Strength intervention (n=45) delivered by a physiotherapist, and included 10 exercises targeting</p>	<p>People after a first or recurrent stroke</p> <p>Mean age (SD): 50.0 (13.9) years N = 144</p> <p>Mean time after stroke: Subacute 7 days - 6 months)</p> <p>Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Six minute walk test at post-intervention and follow up</p> <p>Walking speed at post-intervention and follow up</p> <p>Functional mobility measures at post-intervention and follow up</p> <p>Measures of standing balance at post-intervention and follow up</p>	<p>Setting: Outpatients physiotherapy department in South Africa.</p> <p>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).</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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</p> <p>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.</p>			
<p>Martins 2020²²</p> <p>Subsidiary study: Martins 2017²¹</p>	<p>Circuit class training (n=18)</p> <p>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</p>	<p>People after a first or recurrent stroke</p> <p>Mean age (SD): 55.5 (15.1) years N = 36</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Six minute walk test at post-intervention and follow up</p> <p>Walking speed at post-intervention and follow up</p> <p>Stroke-specific Patient-Reported Outcome Measures at post-intervention and follow up</p> <p>Adverse events at post-intervention and follow up</p>	<p>Setting: Outpatient follow up in Canada.</p> <p>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</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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.</p> <p>Concomitant therapy: All participants received 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totalling 36 sessions.</p>			<p>Amparo a Pesquisa de Minas Gerias (FAPEMIG), and Pro-reitoria de Pesquisa da Universidade Federal de Minas Gerais (PRPq/UFMG).</p>
<p>Moore 2015²³</p>	<p>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.</p>	<p>People after a first or recurrent stroke Mean age (SD): 69 (9.7) years N = 40</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>Any other intervention (n=20) Home stretching programme of matched duration; 45 to 60 minutes. 3 times/week for 19 weeks.</p> <p>Concomitant therapy: No additional information.</p>	<p>Severity: Mild (NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear</p>		
Mudge 2009 ²⁴	<p>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.</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>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</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>
Outermans 2010 ²⁶	<p>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</p>	<p>People after a first or recurrent stroke Mean age (SD): 56.6 (8.6) years N = 43</p> <p>Mean time after stroke: Subacute (7</p>	<p>Six minute walk test at post-intervention Walking speed at post-intervention Measures of standing balance at post-intervention Adverse events at post-intervention</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>30 min/day usual care physiotherapy. Staff:participant ratio: not reported</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>days - 6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>		
<p>Pang 2005²⁷</p> <p>Subsidiary study: Pang 2006²⁸</p>	<p>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</p> <p>Any other intervention (n=31) Upper-limb-related exercise training including strengthening, range of motion, functional reach and manipulation tasks; 1-h session, 3</p>	<p>People after a first or recurrent stroke Mean age (SD): 65.3 (8.8) years N = 63</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

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
	<p>Mobility CCT, provided in circuit. 30 min/day, 3 times/week for 4 weeks. Inpatient rehabilitation. Staff:participant ratio: not reported</p> <p>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).</p> <p>Concomitant therapy: No additional information.</p>	<p>Mean age (SD): 62.2 (8.6) years N = 30</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>		<p>in this review. For further details see English 2017¹¹</p>
Tang 2014 ³³	<p>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.</p> <p>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.</p> <p>Concomitant therapy: No</p>	<p>People after a first or recurrent stroke Mean age (SD): 66.3 (7.1) years N = 50</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Mild (NIHSS 1-5) Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>Six minute walk test at post-intervention Adverse events at post-intervention</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	additional information.			
Vahlberg 2017 ³⁴	<p>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).</p> <p>Any other intervention (n=33) Continue with regular activities. Were not restricted from participating in ordinary physical activities and rehabilitation programs.</p> <p>Concomitant therapy: No additional information.</p>	<p>People after a first or recurrent stroke Mean age (SD): 73.1 (5.4) years N = 67</p> <p>Mean time after stroke: Chronic (>6 months) Ethnicity: Not stated/unclear Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>	<p>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</p>	<p>Setting: Outpatient follow up in Sweden.</p> <p>Sources of funding: Supported by grants from the Medical Faculty at Uppsala University STROKE-Riksförbundet and the Uppsala County Council and municipality in Sweden.</p>
<p>Van de Port 2012³⁶</p> <p>Subsidiary study: Van de Port 2009³⁵</p>	<p>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.</p>	<p>People after a first or recurrent stroke Mean age (SD): 57.0 (10.1) years N = 250</p> <p>Mean time after stroke: Subacute (7 days - 6 months) Ethnicity: Not stated/unclear</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

Study	Intervention and comparison	Population	Outcomes	Comments
	<p>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.</p> <p>Concomitant therapy: No additional information.</p>	<p>Severity: Not stated/unclear Premorbid Modified Rankin Scale: Not stated/unclear</p>		
Verma 2011 ³⁷	<p>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</p> <p>Any other intervention (n=15) Conventional lower limb therapy based on Bobath techniques. 40-min sessions, 7 days/week for 2 weeks.</p> <p>Concomitant therapy: No additional information.</p>	<p>People after a first or recurrent stroke Mean age (SD): 54.2 (7.8) years N = 30</p> <p>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</p>	<p>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</p>	<p>*This study was included in the original Cochrane review that was updated in this review. For further details see English 2017¹¹</p>

1 See Appendix D for full evidence tables.

2

1 **1.1.6 Summary of the effectiveness evidence**

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

Outcomes	No 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	No 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);	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	No 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)	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).
<p>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)</p> <p>b. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)</p> <p>c. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs</p> <p>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)</p> <p>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)</p> <p>f. Downgraded by 1 increment because heterogeneity, unexplained by subgroup analysis</p> <p>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)</p> <p>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)</p> <p>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)</p> <p>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)</p> <p>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)</p> <p>l. Absolute effect calculated by risk difference due to zero events in at least one arm of one study</p> <p>m. Downgraded for heterogeneity due to conflicting number of events in different studies (zero events in one or more studies)</p> <p>n. Downgraded by 2 increments for imprecision due to zero events and small sample size</p>						

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

Outcomes	No 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	No 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	
<p>b. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs</p> <p>c. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs</p> <p>d. Downgraded by 1 increment due to intervention indirectness (does not state staff: participant ratio)</p> <p>e. Downgraded by 2 increments for imprecision due to zero events and small sample size</p> <p>f. Absolute effect calculated by risk difference due to zero events in at least one arm of one study</p>						

1 **Table 5: Clinical evidence summary: Circuit class training compared to no treatment**

Outcomes	No 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	No 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	
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	No 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

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

Outcomes	No 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	No 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 (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	No 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

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

Outcomes	No 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	No 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		
<p>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.)</p> <p>b. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs</p>						

1 See Appendix F for full GRADE tables.

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1 **1.1.7 Economic evidence**

2 **1.1.7.1 Included studies**

3 Two health economic studies were included in this review. {, #4070}¹² The first study
4 compared circuit class training to any other intervention {, #4070} while the second compared
5 circuit class training with education to any other intervention.¹² Note that the second study
6 was also included as part of the community participation review for this guideline.

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

9 **1.1.7.2 Excluded studies**

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

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

1 **1.1.8 Summary of included economic evidence**

2 **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{, #4070}	Partially applicable ^(a)	Potentially serious limitations ^(b)	<ul style="list-style-type: none"> • Within-RCT analysis (Dean 2018{, #4070}). • 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: <ol style="list-style-type: none"> 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)	<p>-0.045 QALYs^(d)</p> <p>From clinical review (2-1) – same paper: ^(e)</p> <p>EQ-5D-5L scores (higher values are better, final value) at 9-months post-randomisation: -0.10</p> <p>Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up: 4.81</p> <p>Other outcomes were reported</p>	Results suggested that the ReTrain intervention dominates usual care (lower costs and higher QALYs).	<p>Cost CI: not reported</p> <p>EQ-5D-5L 95% CI at 9-month follow-up: -0.25 to 0.05 (p=NR)</p> <p>No sensitivity analyses undertaken.</p>

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 £649¹) 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.

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18 **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 2010¹² (UK)	Partially applicable ^(a)	Potentially serious limitations ^(b)	<ul style="list-style-type: none"> • Within-RCT analysis (Harrington 2010¹²) • Cost consequence analysis (various health outcomes) • Population: Adults with stroke living in the community for at least three months • Comparators: <ol style="list-style-type: none"> 1. Standard care plus an information sheet detailing local groups and contact numbers 	£746 ^(c)	From clinical review (2- 1); ¹² Functional mobility measures ^(d) (timed up and go [seconds], lower values	n/a	No sensitivity analyses undertaken.

			<p>(n=124). In all areas stroke survivors were invited to a six-month review.</p> <p>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.</p> <ul style="list-style-type: none"> • Follow-up: 12 months 		are better, final value) at post-intervention: 1.00		
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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

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1 **1.1.9 Economic model**

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

3 **1.1.10 Unit costs**

4 Group training interventions require additional resource use compared to not providing such
5 interventions. As described in Section 1.1.5 Summary of studies included in the effectiveness
6 evidence, in studies included in the clinical review, circuit classes were most commonly
7 delivered by a physiotherapist in an outpatient setting with a staff to participant ratio between
8 1:3 and 1:6 and took place 3 times per week for six weeks and were approximately 60-
9 minute sessions. This would equate to costs of £150 to £372 using the physiotherapist costs
10 shown in Table 6.

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

- 13 • Variation in method of delivery of therapy sessions: studies reported a staff to participant
14 ratio ranging from 1:2-6. The lower the ratio, the more staff are required to assist with the
15 group training, increasing costs.
- 16 • The frequency and duration of the group training delivered, with sessions ranging from
17 30-60 minutes, occurring 2-5 days per week. In the included clinical studies, the
18 interventions were delivered for between 2 weeks and 3 months.
- 19 • Staff who delivered the intervention varied as studies reported that treatment was
20 delivered by either physiotherapists, occupational therapists, or trained instructors. The
21 health economic study (Harrington 2010¹²) used rehabilitation therapists, trained
22 instructors and trained volunteers to deliver the intervention.
- 23 • Study setting: interventions were conducted in hospitals, community and leisure centres,
24 church halls and physiotherapy outpatient rehabilitation centres. Non-clinical settings will
25 incur lower or no costs compared to clinical settings.
- 26 • Additional resource use required to deliver the intervention, such as staff-training costs
27 and information or instructional materials. Several studies included an education
28 component to the intervention. One study (Dean 2018⁹) also mentioned that instructors
29 were specifically trained by the Action for Rehabilitation following Neurological Injury
30 (ARNI) Trust, with courses fees set at £649.¹

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

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

Resource	Cost per working hour (hospital / community) ^(a)	Source
Band 4 PT/OT	£37	PSRRU 2021{, #4635}
Band 5 PT/OT	£41 / £42	
Band 6 PT/OT	£53 / £55	
Band 7 PT/OT	£64 / £66	
Rehabilitation assistant	£33 / £32	PSRRU 2021{, #4635}, estimated based on agenda for change band 3 salary ^(b)

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

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

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

1 **1.1.11 Evidence statements**

2 **Effectiveness/Qualitative**

3 **Economic**

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

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9 One cost-consequence analysis found that for people following stroke, a community exercise
10 and education scheme was dominated by usual care, incurring higher costs (£746 more per
11 participant) after 12 months, while the clinical evidence reported that the intervention
12 performed worse on a functional mobility measure after 9 weeks (mean score of 17.4
13 seconds (SD 7.5)) (16.4 seconds (SD 7.5)). This analysis was assessed as partially
14 applicable with potentially serious limitations.

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16 **1.1.12 The committee's discussion and interpretation of the evidence**

17 **1.1.12.1. The outcomes that matter most**

18 The committee included the following outcomes: person/participant generic health-related
19 quality of life, carer generic health-related quality of life, 6-minute walk test, walking speed,
20 functional mobility measures, measures of standing balance, measures of motor impairment
21 activities of daily living, stroke-specific Patient-Reported Outcome Measures, length of
22 hospital stay and adverse events. All outcomes were considered equally important for
23 decision making and therefore have all been rated as critical.

24 This review updated a published Cochrane review, English, 2018 ¹¹. Therefore, the outcomes
25 used in this review are the same as those reported in the Cochrane review, with the inclusion
26 of carer generic health-related quality of life to maintain consistency with other reviews in this
27 guideline. Stroke specific Patient Reported Outcome Measures were included in the
28 Cochrane review but combined with health-related quality of life outcomes. These outcomes
29 have been reported separately in this review, for consistency with previous reviews and to
30 provide greater insight into how the interventions affect the persons functional abilities or
31 quality of life more specific to their condition.

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

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

41 **1.1.12.2 The quality of the evidence**

42 One systematic review and in total 27 randomised controlled trial studies were included in
43 the review. The evidence varied from high to very low quality, with the majority being of low
44 quality. Outcomes were commonly downgraded for risk of bias, inconsistency and
45 imprecision due to uncertainty around the effect estimate. Risk of bias was rated as a

1 concern in the majority of the studies. This was generally due to bias arising from the
2 randomisation process, deviations from the intended interventions, missing outcome data
3 and in the measurement of the reported result.

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

12 Fourteen outcomes were downgraded for indirectness due to either intervention or outcome
13 indirectness. In most cases this was due to the studies not stating the staff:participant ratio
14 for the circuit classes. The protocol, adapted from the included Cochrane review¹¹, only
15 included studies with a staff:participant ratio of 1:3. Any studies which did not explicitly state
16 the ratio or had a greater staff ratio were downgraded for intervention indirectness. One
17 study³⁴ reported withdrawal due to adverse events rather than all adverse events and so
18 outcomes including this data were downgraded for outcome indirectness. One study was
19 considered to have two sources of intervention indirectness as it did not state the staff
20 participant ratio and it compared circuit class training with education to the same circuit class
21 training with mental imagery instead. This did not fit exactly into any of the comparisons
22 included in the protocol, however, it has been classified as circuit class training with
23 education versus circuit class training without education. This study only included one
24 relevant outcome measure so did not greatly influence the results presented in this review.

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

33 **1.1.12.3 Benefits and harms**

34 **1.1.12.3.1. Key uncertainties**

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

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

1 considered as an option for other types of therapies as this was considered as a helpful
2 option by the lay members on the committee.

3

4 **1.1.12.3.2. Circuit class training without education compared to any other intervention,**
5 **other types of circuit class training and no treatment**

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

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

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

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

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

49

1 **1.1.12.3.3. Circuit class training with education compared to any other intervention**
2 **and circuit class training without education**

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

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

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

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

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

32 **1.1.12.4 Cost effectiveness and resource use**

33 The review identified two UK-based health economic analyses. The first study was a within-
34 trial cost-utility analysis of a pilot feasibility RCT. The control group received treatment as
35 usual, which ranged from zero treatment to engagement with any health service(s). All
36 participants were asked to not participate in additional physical rehabilitation (either NHS or
37 private) but received an advice booklet about exercise. The circuit-based training group
38 received twice-weekly 2-hour sessions over 3 months followed by 3 (one per month) drop-in
39 sessions. The results found that the circuit-based training program was dominated (higher costs
40 and lower quality of life) by usual care, reporting a mean cost per participant of £777 for a
41 QALY loss of -0.045. The clinical results also showed that the control group performed better
42 on a functional mobility measure (timed up and go, lower values are better) with a mean
43 difference of 4.81 seconds compared to the intervention group, however this is in contrast to
44 the wider evidence base which reported clinical benefits and no harms compared to usual
45 care. The results suggest that circuit class training is not cost-effective, however, the study
46 was assessed as partially applicable for this review as EQ-5D-5L scores were used to
47 calculate QALYs when the NICE reference case currently prefers EQ-5D-3L. It was also not
48 stated that an NHS and PSS perspective is taken however, the costs included are all
49 considered relevant if the intervention is funded by the NHS. Potentially serious limitations
50 were also identified, as the analysis was based on a pilot feasibility RCT (n=45) that was not
51 powered to test the effectiveness of the intervention or differences in healthcare resource

1 use. The aim was to inform a future study where effectiveness and cost-effectiveness could
2 be assessed. The within-trial analysis also meant that results only reflect the health
3 outcomes and costs from a single trial and the 9-month follow-up period may not capture full
4 health effects of the intervention if these persist. Furthermore, cost sources were not
5 reported, making it difficult to assess how the intervention compared to current practice: only
6 the total intervention cost per participant was reported and it was unclear whether this
7 included the training course fees (set at £649¹) that instructors were required to complete
8 before delivering the program, while other healthcare resource use was collected but not
9 included. Sensitivity analysis was not performed on areas of uncertainty.

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

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

43 In addition to these studies, relevant unit costs were presented to the committee to inform
44 consideration of cost-effectiveness. Additional resource use associated with circuit class
45 training will largely relate to staff time, with the majority of studies in the clinical review
46 reporting that a physiotherapist had delivered the intervention in an outpatient setting. Circuit
47 classes most commonly took place three times per week for 6 weeks, with sessions typically
48 lasting 60 minutes. The staff participant ratio varied between studies and ranged from 1:3 –
49 1:6, with higher proportions of participants incurring lower staff costs. Based on this
50 description it was estimated that the cost of circuit class training would be between £150-
51 £372, based on either a band 6 or 7 physiotherapist delivered the intervention. However,
52 during the committee discussion it was noted that a band 4 or 5 physiotherapist could also
53 deliver the intervention, as well as physiotherapist assistant, which would further reduce staff
54 costs. Additional resource use would also be incurred for interventions containing an

1 educational component or staff training costs. It was not possible to assess the potential for
2 downstream cost-savings based on the clinical evidence reported.

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

17 **1.1.12.5 Other factors the committee took into account**

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

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

34 **1.1.13 Recommendations supported by this evidence review**

35 This evidence review supports recommendation 1.13.23.
36

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1 Appendices

2 Appendix A – Review protocols

3 Review protocol for the clinical and cost effectiveness of group training to 4 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	<p>Key paper:</p> <p>English C, Hillier SL, Lynch EA. Circuit class therapy for improving mobility after stroke. <i>Cochrane Database of Systematic Reviews</i> 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3.</p> <p>The following databases (from inception) will be searched:</p> <ul style="list-style-type: none"> • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Epistemonikas • PsycINFO • AMED • CINAHL <p>Searches will be restricted by:</p> <ul style="list-style-type: none"> • English language studies • Human studies • Date limitation: From January 2017 <p>Other searches:</p> <ul style="list-style-type: none"> • Inclusion lists of systematic reviews

		<p>The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant.</p> <p>The full search strategies will be published in the final review.</p> <p>Medline search strategy to be quality assured using the PRESS evidence-based checklist (see methods chapter for full details).</p>
5.	Condition or domain being studied	Adults and young people (16 or older) after a stroke
6.	Population	<p>Inclusion:</p> <ul style="list-style-type: none"> • Adults (age ≥ 16 years) who have had a first or recurrent stroke (including people after subarachnoid haemorrhage) <p>Exclusion:</p> <ul style="list-style-type: none"> • Children (age < 16 years) • People who have had a transient ischaemic attack
7.	Intervention	<ul style="list-style-type: none"> • Circuit class training <ul style="list-style-type: none"> ○ 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	<ul style="list-style-type: none"> • Other types of circuit class training • Any other intervention, including: <ul style="list-style-type: none"> ○ Active interventions aiming at improving mobility/usual care (including individual therapy) • No treatment
9.	Types of study to be included	<ul style="list-style-type: none"> • Systematic reviews of RCTs • Parallel RCTs <p>If insufficient RCT evidence is available, non-randomised studies will be considered, including:</p> <ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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)	<p>All outcomes are considered equally important for decision making and therefore have all been rated as critical:</p> <p>At time period:</p> <ul style="list-style-type: none"> • Post-intervention • Follow-up (wherever available, for example: 3-6 months post-intervention) <ul style="list-style-type: none"> • Person/participant generic health-related quality of life (continuous outcomes will be prioritised [validated measures]) <ul style="list-style-type: none"> ○ 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]) <ul style="list-style-type: none"> ○ EQ-5D ○ SF-6D ○ SF-36 ○ SF-12 ○ Other utility measures (AQOL, HUI, 15D, QWB) • 6-minute walk test (continuous outcomes will be prioritised)

		<ul style="list-style-type: none"> • Walking speed (continuous outcomes will be prioritised) <ul style="list-style-type: none"> ○ 5 metre walk test ○ 10 metre walk test • Functional mobility measures <ul style="list-style-type: none"> ○ Timed Up and Go (continuous outcomes will be prioritised) ○ Rivermead Mobility Index (continuous outcomes will be prioritised) • Measures of standing balance <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ 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) <ul style="list-style-type: none"> ○ 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) <ul style="list-style-type: none"> ○ 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)
14.	Data extraction (selection and coding)	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.

		<p>All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated.</p> <p>10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer.</p> <p>The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above.</p> <p>A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4).</p> <p>10% of all evidence reviews are quality assured by a senior research fellow. This includes checking:</p> <ul style="list-style-type: none"> • 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 <p>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.</p> <p>Study investigators may be contacted for missing data where time and resources allow.</p>
15.	Risk of bias (quality) assessment	<p>Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual.</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. <p>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</p>

		<p>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.</p> <ul style="list-style-type: none"> • 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. <p>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/</p> <ul style="list-style-type: none"> • 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	<p>Subgroups that will be investigated if heterogeneity is present:</p> <p>Time after stroke at the start of the trial</p> <ul style="list-style-type: none"> • Hyperacute <72 hours • Acute 72 hours – 7 days • Subacute 7 days – 6 months • Chronic >6 months <p>Premorbid Modified Rankin scale</p> <ul style="list-style-type: none"> • 1-2 • >2 <p>Severity (as stated by category or as measured by NIHSS scale):</p> <ul style="list-style-type: none"> • 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	<input checked="" type="checkbox"/>	Intervention
		<input type="checkbox"/>	Diagnostic
		<input type="checkbox"/>	Prognostic
		<input type="checkbox"/>	Qualitative

		<input type="checkbox"/>	Epidemiologic	
		<input type="checkbox"/>	Service Delivery	
		<input type="checkbox"/>	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	<input type="checkbox"/>	<input type="checkbox"/>
		Piloting of the study selection process	<input type="checkbox"/>	<input type="checkbox"/>
		Formal screening of search results against eligibility criteria	<input type="checkbox"/>	<input type="checkbox"/>
		Data extraction	<input type="checkbox"/>	<input type="checkbox"/>
		Risk of bias (quality) assessment	<input type="checkbox"/>	<input type="checkbox"/>
		Data analysis	<input type="checkbox"/>	<input type="checkbox"/>
24.	Named contact	<p>5a. Named contact National Guideline Centre</p> <p>5b Named contact e-mail StrokeRehabUpdate@nice.nhs.uk</p> <p>5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and National Guideline Centre</p>		
25.	Review team members	<p>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)</p>		

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: <ul style="list-style-type: none"> • 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	<input type="checkbox"/>	Ongoing
		<input type="checkbox"/>	Completed but not published
		<input checked="" type="checkbox"/>	Completed and published
		<input type="checkbox"/>	Completed, published and being updated

		<input type="checkbox"/>	Discontinued
35.	Additional information	N/A	
36.	Details of final publication	www.nice.org.uk	

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1 **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	<ul style="list-style-type: none"> • 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	<p>A health economic study search will be undertaken using population-specific terms and a health economic study filter – see appendix B below.</p> <p>Databases searched:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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</p> <p>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.</p> <p>Inclusion and exclusion criteria</p> <ul style="list-style-type: none"> • 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. <p>Where there is discretion</p>

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.

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1 Appendix B – Literature search strategies

B.1 Clinical search literature search strategy

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

8 **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

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3 **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)

1 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)

1 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

1 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 psychlit 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)

1 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
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1 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

	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*))
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B.2 Health Economics literature search strategy

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

10 **Table 2: Database parameters, filters and limits applied**

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

1 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

1 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 hqi* 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

1 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

2 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])
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3 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

1 **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

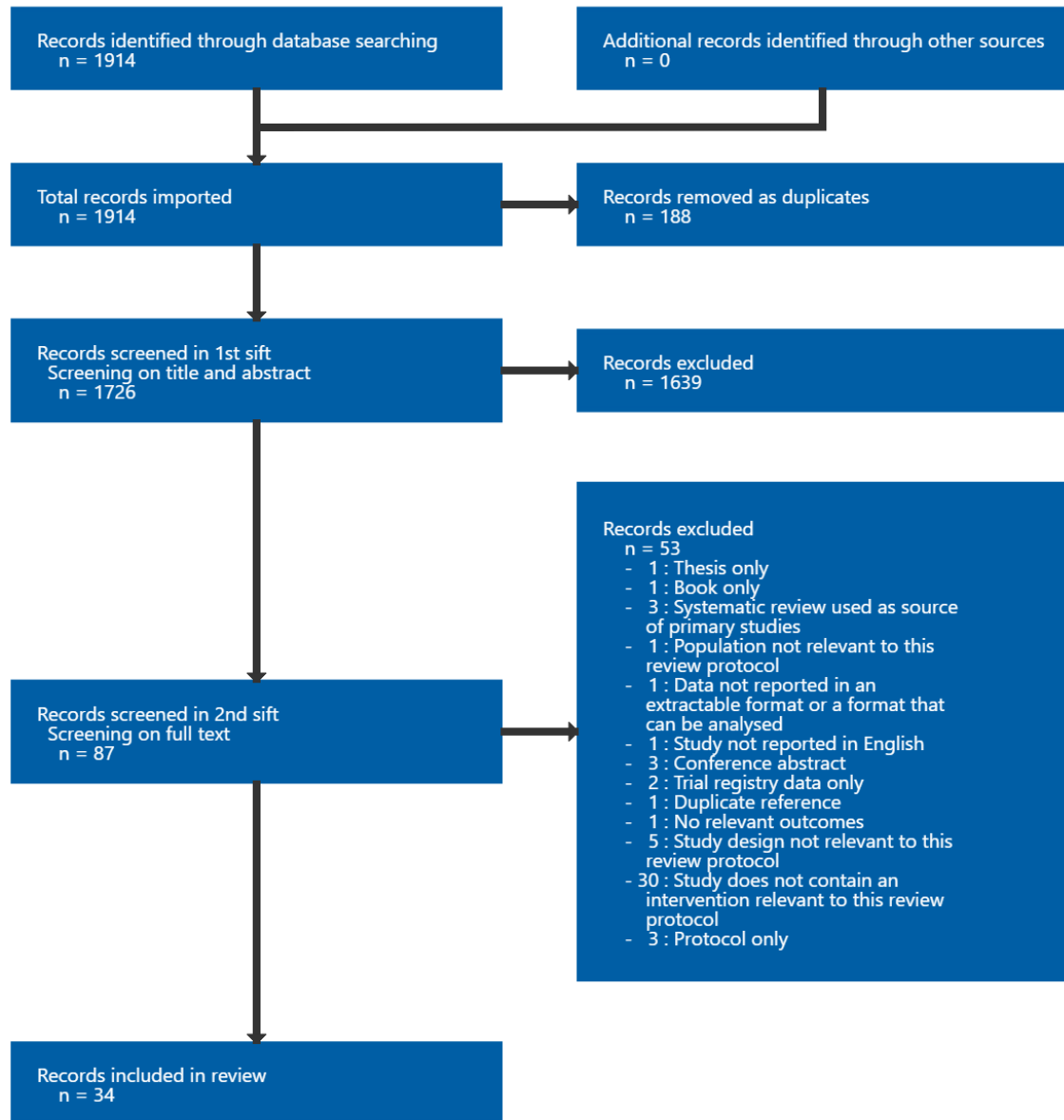
1

2

3

1 **Appendix C – Effectiveness evidence study selection**

2 **Figure 1: Flow chart of clinical study selection for the review of group training for**
 3 **walking**



4
5
6
7
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10

1 Appendix D – Effectiveness evidence

2

3 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

4

5 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)	<p>Circuit class training (group based) N=11</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>
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.

1

2 **Study arms**3 ***Circuit class training (group based) (N = 11)***

4 Circuit training program performed with 2 or more patients designed focusing on the major impairments of the stroke. This circuit was
5 comprised of five stations including Sit to Stand training, Step up forward, backwards and sideways, trunk control and rotation,
6 reaching out in various directions collecting an object and passing on other side. People were required to spend five minutes on each
7 stations in order to provide intensive treatment experience and more frequent repetitions. Every week there was an increase in
8 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
9 weeks. Concomitant therapy: No additional information.

10

11 ***Any other intervention (individual based circuit class training) (N = 11)***

12 The same program but completed as an individual with 1:1 supervision. Concomitant therapy: No additional information.

1

2 **Characteristics**3 ***Study-level characteristics***

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

4

5 ***Arm-level characteristics***

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

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

1

2 **Outcomes**

3 **Study timepoints**

- 4 • Baseline
- 5 • 6 week (Post-intervention)

6

7 **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)

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

3
4

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

6 **Continuous outcomes - Walking speed (10 metre walk test) - Final values - Mean SD - Circuit class training (group based) - Any other intervention**
 7 **(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

8

1 **Continuous outcomes- Measures of standing balance (Berg balance scale)- Final values- Mean SD- Circuit class training (group based)- Any**
 2 **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

3

4 **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

5

6 **Study details**

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

1

2 **Study arms**3 ***Circuit class training (mobility-related CCT) (N = 15)***

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

7

8 ***Other type of circuit class training (upper limb-related CCT) (N = 15)***

9 Upper limb-related CCT, 10 5-minute workstations consisting of functional tasks to improve reach to grasp, hand eye co-ordination,
10 stretching and strengthening exercises; 1 h/day, 5 days/week for 4 weeks. Staff:participant ratio: 1:4. Concomitant therapy: Both
11 groups received additional CCT therapy in addition to usual care

12

1 **Characteristics**2 ***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	n = 7 ; % = 47	n = 6 ; % = 40
Sample size		
Mean age (SD) (years)	53.9 (19.8)	56.3 (10.5)
Mean (SD)		
Ethnicity	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Comorbidities	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Time after stroke (days)	36 (25.1)	50.1 (49.2)
Mean (SD)		
Premorbid Modified Rankin scale	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Severity	n = NR ; % = NR	n = NR ; % = NR
Sample size		

3

1 **Outcomes**2 **Study timepoints**

- 3 • Baseline
- 4 • 4 week (Post-intervention)
- 5 • 6 month (Follow-up)

6

7 **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)						

- 1 6-minute walk test - Final values - Polarity - Higher values are better
- 2 Functional mobility measures (Timed up and Go test) - Final values - Polarity - Lower values are better
- 3 Length of hospital stay (start group to discharge) - Final values - Polarity - Lower values are better

4
5

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

7 **Continuous outcomes-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

9

10 **Continuous outcomes-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

1

2 ***Continuous outcomes-Functional mobility measures (Timed up and Go test)-Final values-Mean SD-Circuit class training (mobility-related***
3 ***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

4

5 ***Continuous outcomes-Functional mobility measures (Timed up and Go test)-Final values-Mean SD-Circuit class training (mobility-related***
6 ***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

7

8 ***Continuous outcomes-Length of hospital stay (start group to discharge)-Final values-Mean SD-Circuit class training (mobility-related CCT)-***
9 ***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

1

2 **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

3

4 **Study details**

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	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)	<p data-bbox="443 794 1848 821">Circuit class training with education (structured progressive circuit class training with health education) N=20</p> <p data-bbox="443 869 2042 1268">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.</p> <p data-bbox="443 1380 1064 1412">Concomitant therapy: No additional information.</p>

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	<p>Circuit class training (structured progressive circuit class training with mental imagery) N=20</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>
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).

1

2 **Study arms**3 ***Circuit class training with education (structured progressive circuit class training with health education) (N = 20)***

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

16

17 ***Circuit class training (structured progressive circuit class training with mental imagery) (N = 20)***

18 25 minutes of mental imagery preceded by 65 minutes of structured program circuit class training. Both groups practiced 3 times a
19 week for 4 weeks. The same circuit class training was provided, with mental imagery being practiced in four phases. Before starting
20 the mental imagery, participants were familiarised with the tasks. Practice was performed in a sitting position with eyes closed the 1st
21 person perspective. For visual imagery, to visualise their movements being performed from inside of their body, as if they are looking

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

6

7 **Characteristics**

8 ***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	n = 9 ; % = 45	n = 5 ; % = 25
Sample size		
Mean age (SD) (years)	55.55 (10.74)	49.9 (11.59)
Mean (SD)		
Ethnicity	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Comorbidities	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Time after stroke (Weeks)	28.85 (12.94)	25 (15.46)
Mean (SD)		

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	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Severity NIHSS.	3.15 (1.31)	3.45 (1.39)
Mean (SD)		

1

2 **Outcomes**

3 **Study timepoints**

- 4 • Baseline
- 5 • 4 week (End of intervention)

6

7 **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)				

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

2

3

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

5 **Continuous outcome-walking speed (gait speed)-final values-Mean SD-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 <i>(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.)</i>

7

1 **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

2

3 **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.

1

2 **Study arms**

3 ***Circuit class training (mobility-related circuit class training) (N = 6)***

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

7

8 ***Any other intervention (upper limb-related circuit class training) (N = 6)***

9 Upper limb-related CCT, workstations consisting of upper limb tasks; 1 h, 3 times/week for 4 weeks. Staff:participant ratio: 1:6.
 10 Concomitant therapy: No additional information.

11

12 **Characteristics**

13 ***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	n = 3 ; % = 50	n = 2 ; % = 33.3
Sample size		

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)	66.2 (7.7)	62.3 (6.6)
Mean (SD)		
Ethnicity	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Comorbidities	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Time after stroke (years)	2.3 (0.7)	1.3 (0.9)
Mean (SD)		
Premorbid Modified Rankin scale	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Severity	n = NR ; % = NR	n = NR ; % = NR
Sample size		

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 4 week (End of intervention.)
- 6 • 2 month (Follow-up.)

1

2 **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.	NR (NR)	9.8 (4)	NR (NR)	NR (NR)	5.8 (4.3)	NR (NR)
Mean (SD)						

- 1 6-minute walk test - Final values - Polarity - Higher values are better
- 2 Walking speed (walking speed without assistive devices) - Final values - Polarity - Higher values are better
- 3 Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
- 4 Measures of standing balance (step test) - Final values - Polarity - Higher values are better
- 5
- 6

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

2 **Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other**
 3 **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

4

5 **Continuousoutcomes-6-minutewalktest-Finalvalues-MeanSD-Circuit class training (mobility-related circuit class training)-Any other**
 6 **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

7

8 **Continuousoutcomes-Walkingspeed(walkingspeedwithoutassistivedevices)-Finalvalues-MeanSD-Circuit class training (mobility-related**
 9 **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

10

1 **Continuousoutcomes-Walkingspeed(walkingspeedwithoutassistivedevices)-Finalvalues-MeanSD-Circuit class training (mobility-related**
 2 **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

3

4 **Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training (mobility-related circuit**
 5 **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

6

7 **Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit class training (mobility-related circuit**
 8 **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

9

1 **Continuous outcomes- Measures of standing balance (step test)- Final values- Mean SD- Circuit class training (mobility-related circuit class**
 2 **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

3

4 **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

5

6 **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.

7

8

1 **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

2

3 **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	<p>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. <i>BMC neurology</i> 9: 38</p> <p>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. <i>Cochrane Database of Systematic Reviews</i> 2017, Issue 6. Art. No.: CD007513. DOI: 10.1002/14651858.CD007513.pub3. For further information about the data extraction please see the Cochrane review.</p>
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.

1

2 **Study arms**3 ***Circuit class training (mobility-related circuit class training) (N = 76)***

4 Mobility-related CCT, task-related training with progressive balance, strengthening, standing, walking and stair climbing exercises,
5 home programme and advice to increase walking. Staff:participant ratio: Not reported. Concomitant therapy: No additional information.

6

7 ***Any other intervention (upper-limb related circuit class training) (N = 75)***

8 Upper-limb related CCT, task-related strength and co-ordination training, cognitive training, home programme and advice to increase
9 use of upper limb and engage in more cognitive tasks. Staff:participant ratio: Not reported. Concomitant therapy: No additional
10 information.

11

12 **Characteristics**13 ***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)	66.7 (14.3)	67.5 (10.2)
Mean (SD)		
Ethnicity	n = NR ; % = NR	n = NR ; % = NR
Sample size		
Comorbidities	n = NA ; % = NA	n = NA ; % = NA
Sample size		
Visual impairment	n = 61 ; % = 80	n = 56 ; % = 75
Sample size		
Hearing impairment	n = 26 ; % = 34	n = 26 ; % = 35
Sample size		
Parkinson's disease	n = 1 ; % = 1	n = 1 ; % = 1
Sample size		
PVD/leg ulcers	n = 4 ; % = 5	n = 5 ; % = 7
Sample size		
Diabetes	n = 16 ; % = 21	n = 14 ; % = 19
Sample size		
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	n = 44 ; % = 57	n = 44 ; % = 59
Sample size		
Asthma/COPD	n = 16 ; % = 21	n = 11 ; % = 15
Sample size		
Incontinence	n = 20 ; % = 26	n = 19 ; % = 25
Sample size		
Epilepsy	n = 14 ; % = 18	n = 11 ; % = 15
Sample size		
osteoporosis	n = 16 ; % = 21	n = 8 ; % = 11
Sample size		
arthritis	n = 34 ; % = 45	n = 28 ; % = 37
Sample size		
Hip fracture	n = 5 ; % = 7	n = 2 ; % = 3
Sample size		
Vertigo/dizziness	n = 29 ; % = 38	n = 26 ; % = 35
Sample size		
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)	6.7 (6.7)	5.2 (5.4)
Mean (SD)		
Premorbid Modified Rankin scale	NR (NR)	NR (NR)
Mean (SD)		
Severity	n = NR ; % = NR	n = NR ; % = NR
Sample size		

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 12 month (Post-intervention)

6

7 **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	37 (10)	0 (9)	33 (9)	2 (9)
Mean (SD)				
SF-12 mental composite	50 (11)	0 (11)	50 (12)	0 (12)
Mean (SD)				
6-minute walk test - Change scores (meters) Change scores. Taken from the report by combining the slower walkers and faster walkers scores.	234 (124)	32 (37.8)	220 (131)	-2.5 (50.5)
Mean (SD)				
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.	0.87 (0.46)	0.015 (0.21)	0.84 (0.52)	-0.054 (0.18)
Mean (SD)				
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).	5.4 (4)	0.4 (2.8)	5.2 (4.1)	0.2 (3.2)
Mean (SD)				

- 1 Person/participant generic health-related quality of life (SF-12) - change scores - Polarity - Higher values are better
- 2 6-minute walk test - Change scores - Polarity - Higher values are better
- 3 Walking speed (10 meter walk test) - change scores - Polarity - Higher values are better
- 4 Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
- 5 Measures of standing balance (step test) - Change scores - Polarity - Higher values are better

6 **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)				

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

2 **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.	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0
No of events				

3 Adverse events - Polarity - Lower values are better

4

5

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

2 **Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-12)-changescores-SF-12physicalcomposite-MeanSD-**
 3 **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.)

4

5 **Continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-12)-changescores-SF-12mentalcomposite-MeanSD-Circuit**
 6 **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.)

7

8 **Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training (mobility-related circuit class training)-Any other**
 9 **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.)

10

1 **Continuous outcomes-Walkingspeed(10meterwalktest)-changescores-MeanSD-Circuit class training (mobility-related circuit class**
 2 **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.)

3

4 **Continuous outcomes-Functionalmobilitymeasures(timedupandgo)-Changescores-MeanSD-Circuit class training (mobility-related circuit**
 5 **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.)

6

7 **Continuous outcomes-Measuresofstandingbalance(stepstest)-Changescores-MeanSD-Circuit class training (mobility-related circuit class**
 8 **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.)

9

1 **Continuous outcome (Affected knee strength) - Measures of motor impairment (affected knee strength) - change scores - Mean SD - Circuit class**
 2 **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.)

3

4 **Dichotomous outcome - Adverse events - No of Events - Circuit class training (mobility-related circuit class training) - Any other intervention**
 5 **(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.)

6

7 **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

8

9 **Study details**

Secondary publication of another included	No additional information.
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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

	<p>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.</p> <p>Concomitant therapy: No additional information.</p>
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	<p>Any other intervention (usual care) N=22</p> <p>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.</p>

	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.

1

2 **Study arms**3 ***Circuit based training (ReTrain program) (N = 23)***

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

13

14 ***Any other intervention (usual care) (N = 22)***

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

1

2 **Characteristics**3 ***Arm-level characteristics***

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

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

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

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 6 month (Post-intervention)
- 6 • 9 month (Follow-up)

7

1 **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)

2 Person/participant generic health-related quality of life (EQ-5D-5L) - Final values - Polarity - Higher values are better

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

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

1 **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	n = NA ; % = NA	n = NA ; % = NA	n = 19 ; % = 91	n = NA ; % = NA	n = NA ; % = NA	n = 19 ; % = 95
No of events						

2 Adverse events - Polarity - Lower values are better

3

4

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

6 **Continuous outcomes - Person/participant generic health-related quality of life (EQ-5D-5L) - Final values - Mean SD - 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

8

1 **Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit based training (ReTrain program)-Any**
 2 **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

3

4 **Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-finalvalues-MeanSD-Circuit based training (ReTrain program)-Any**
 5 **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

6

7 **Continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeQualityoflifescala)-Finalvalues-MeanSD-Circuit based**
 8 **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

9

1 **Dichotomous outcome-Adverse events-No Of Events-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

2

3 **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
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4

5 **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)	<p>Circuit class training N=93</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>
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	<p>Any other intervention (usual care) N=190</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>
Number of participants	283
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Additional comments	Unclear method of analysis

1 Study arms

2 ***Circuit class training (N = 93)***

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

12

13 ***Any other intervention (usual care) (N = 190)***

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

18

19 Characteristics

20 ***Arm-level characteristics***

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

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

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 4 week (End of intervention)

6

1 **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
<p>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.</p> <p>Mean (SD)</p>	33 (110.4)	116 (179)	35.1 (107.4)	106.8 (173)
<p>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.</p> <p>Mean (SD)</p>	0.16 (0.44)	0.48 (0.6)	0.16 (0.42)	0.45 (0.61)
<p>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.</p> <p>Mean (SD)</p>	NR (NR)	0.22 (0.38)	NR (NR)	0.22 (0.44)
<p>Activities of daily living (Functional Independence Measure) - Final values. Scale range: 18-126. Final values.</p> <p>Mean (SD)</p>	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.	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Mean (SD)				
SIS - Physical Domain score Scale range: 0-100	NR (NR)	45.9 (36.9)	NR (NR)	50 (40.2)
Mean (SD)				
SIS - Recovery score Scale range: 0-100	NR (NR)	50 (30)	NR (NR)	50 (40)
Mean (SD)				
Length of hospital stay - Final values (days) Final values.	NA (NA)	46 (38)	NA (NA)	50 (44.1)
Mean (SD)				

- 1 6-minute walk test - Final values - Polarity - Higher values are better
- 2 Walking speed (gait speed) - final value - Polarity - Higher values are better
- 3 Person/participant generic health-related quality of life (AQoL) - Final values - Polarity - Higher values are better
- 4 Activities of daily living (Functional Independence Measure) - Final values. - Polarity - Higher values are better
- 5 Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Final values - Polarity - Higher values are better
- 6 Length of hospital stay - Final values - Polarity - Lower values are better

1 **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	n = NA ; % = NA	n = 21 ; % = 23	n = NA ; % = NA	n = 28 ; % = 15
No of events				

2 Adverse events - Polarity - Lower values are better

3

4

5 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**6 **Continuous outcomes-6-minutewalktest-Final values-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

7

8 **Continuous outcomes-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

1

2 **Continuous outcomes-Person/participant generic health-related quality of life (AQoL)-Final values-Mean SD-Circuit class training-Any other**
 3 **intervention (usual care)-t4**

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

4

5 **Continuous outcomes-Activities of daily living (Functional Independence Measure)-Final values.-Mean SD-Circuit class training-Any other**
 6 **intervention (usual care)-t4**

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

7

8 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Final values-Mean SD-Circuit class**
 9 **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

10

1 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Final values-SIS-Physical Domains score-**
 2 **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

3

4 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Final values-SIS-Recovery score-MeanSD-**
 5 **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

6

7 **Continuous outcomes-Length of stay-Final values-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

8

9 **Dichotomous outcome-Adverse events-No Of Events-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

1

2 **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
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3

4 **Study details**

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

1

2 **Study arms**3 ***Circuit class therapy with education (N = 119)***

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

7

8 ***Any other intervention (standard care) (N = 124)***

9 Standard care and information sheet with list of local exercise classes. Duration and frequency: not reported. Staff:participant ratio: 2:9
10 Concomitant therapy: No additional information.

1

2 **Characteristics**3 ***Arm-level characteristics***

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

4

1 **Outcomes**2 **Study timepoints**

- 3 • Baseline
- 4 • 9 week (End of intervention)

5

6 **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)

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

8

9

10 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**11 **Continuous outcomes-Functional mobility measures (timed up and go)-final values-Mean SD-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

1

2 **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

3

4 **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.

5

6

7 **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

8

1 **Study details**

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	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.
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1

2 **Study arms**3 ***Circuit class training with education (N = 15)***

4 Mobility-related circuit-class therapy, focus on physical activity and functional performance and education about falls risk. Circuit class
5 therapy duration not specified, 7 sessions a week for 5 weeks; education 1 h/week for 5 weeks. Staff:participant ratio: not reported.

6 Concomitant therapy: No additional information.

7

8 ***Any other intervention (education only) (N = 19)***

9 Education about coping with hidden dysfunctions after stroke 1 h/week for 5 weeks. Concomitant therapy: No additional information.

10

11 **Characteristics**12 ***Arm-level characteristics***

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

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

1

2 **Outcomes**3 **Study timepoints**

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

7

1 **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.	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Mean (SD)						
SF-36 physical component summary	30.9 (8.3)	32.2 (10.6)	35.3 (13.3)	30.8 (10.7)	33.2 (12)	35.4 (12.9)
Mean (SD)						
SF-36 mental component summary	53.6 (10)	54.4 (10.3)	50.4 (15)	52.8 (9.2)	54.8 (10)	55.4 (9.3)
Mean (SD)						

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

3

4

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **Continuous outcomes - Person/participant generic health-related quality of life (SF-36) - Final values - SF-36 physical components summary -**
3 **Mean SD - 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.)

4

5 **Continuous outcomes - Person/participant generic health-related quality of life (SF-36) - Final values - SF-36 mental components summary -**
6 **Mean SD - 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.)

7

8 **Continuous outcomes - Person/participant generic health-related quality of life (SF-36) - Final values - SF-36 mental components summary -**
9 **Mean SD - 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.)

10

1 **Continuous outcomes-Person/participant generic health-related quality of life (SF-36)-Final values-SF-36 physical components summary-**
 2 **Mean SD-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.)

3

4 **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

5

6 **Study details**

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

Study 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)	<p>Circuit class training N=30</p> <p>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.</p> <p>Concomitant therapy: No additional information.</p>

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).

1 **Study arms**2 ***Circuit class training (N = 30)***

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

13

14 ***Any other intervention (stretching) (N = 15)***

15 Whole-body static stretching performed for 1 hour per class, twice a week for 8 weeks. Concomitant therapy: No additional
 16 information.

17

18 **Characteristics**19 ***Arm-level characteristics***

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

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

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

2

3 **Outcomes**

4 **Study timepoints**

- 5 • Baseline
- 6 • 8 week (Post-intervention)

7

1 **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)

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

3 Measures of standing balance (Berg balance scale) - Final values - Polarity - Higher values are better

4 Measures of motor impairment (Korean - Trunk impairment scale) - Final values - Polarity - Higher values are better

5

6

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

2 **Continuous outcomes-Functional mobility measures (timed up and go)-final values-Mean SD-Circuit class training-Any other intervention**
 3 **(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)

4

5 **Continuous outcomes-Measures of standing balance (Berg balance scale)-Final values-Mean SD-Circuit class training-Any other intervention**
 6 **(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)

7

8 **Continuous outcomes-Measures of motor impairment (Korean-Trunk impairment scale)-Final values-Mean SD-Circuit class training-Any other**
 9 **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)

10

1 **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

2

3 **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)	<p>Circuit class training N=15</p> <p>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.</p> <p>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.</p>
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)

1

2 **Study arms**3 ***Circuit class training (N = 15)***

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

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

5
 6 **Any other intervention (individual task-oriented exercise) (N = 15)**

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

11
 12 **Characteristics**

13 **Arm-level characteristics**

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

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

1

2 **Outcomes**

3 **Study timepoints**

- 4 • Baseline
- 5 • 4 week (Post-intervention)

6

7 **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)	233.4 (143.8)	103.33 (82.62)	160.7 (115.5)	42.07 (36.09)
Change scores				
Mean (SD)				

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)

- 1 6-minute walk test - Change scores - Polarity - Higher values are better
2 Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
3 Measures of standing balance (Berg Balance Scale) - Change scores - Polarity - Higher values are better

4

5

6 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**7 **Continuous outcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (individual task-oriented exercise)-t4**

8

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

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

1

2 ***Continuousoutcomes-Functionalmobilitymeasures(timedupandgo)-Changescores-MeanSD-Circuit class training-Any other intervention***
 3 ***(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 <i>(Intervention indirectness: Staff:participant ratio higher than that stated in the protocol.)</i>

4

5 ***Continuousoutcomes-Measuresofstandingbalance(BergBalanceScale)-Changescores-MeanSD-Circuit class training-Any other***
 6 ***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 <i>(Intervention indirectness: Staff:participant ratio higher than that stated in the protocol.)</i>

7

8 **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

9

1 **Study details**

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

2

3 **Study arms**4 ***Mobility Circuit class training (N = 10)***

5 mobility-related CCT, including trunk exercises, active sitting practice, sit-to-stand practice, standing and walking practice, aerobic
6 exercise and strength training; 90 min/per day, 5 days/ week for 4 weeks

7

1 **Usual care (N = 10)**

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

4

5 **Outcomes**6 **Study timepoints**

- 7 • Baseline
- 8 • 4 week

9

10 **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)	167.5 (121.8)	261 (115.4)	157.5 (64)	276 (69.8)
Mean (SD)				
Measures of standing balance (Berg balance scale) final value 0-59	36.3 (11.7)	46.7 (9.4)	39 (8.7)	49.8 (4.6)
Mean (SD)				
Activities of daily living (Korean modified barthel index) final value 0-100	65.7 (23.3)	87 (10.5)	57.4 (22.4)	85.3 (13.7)
Mean (SD)				

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	25.4 (7.4)	27.4 (6.7)	22.9 (7.9)	25.9 (4.8)
Mean (SD)				

- 1 6 minute walk test - final value - Polarity - Higher values are better
- 2 Measures of standing balance (Berg balance scale) final value - Polarity - Higher values are better
- 3 Activities of daily living (Korean modified barthel index) final value - Polarity - Higher values are better
- 4 Functional mobility measure (FMA - LL) final value - Polarity - Higher values are better

5 **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)	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0
No of events				

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

7
8

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

10 **Continuous outcomes-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)

1

2 **Continuous outcomes-Activities of daily living (Korean modified Barthel index) final value-Mean SD-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)

3

4 **Continuous outcomes-Measures of standing balance (Berg balance scale) final value-Mean SD-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)

5

6 **Continuous outcomes-6 minute walk test-final value-Mean SD-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)

7

1 **Dichotomous outcomes-adverse events (serious adverse events)-No Of Events-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)

2

3 **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
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4

5 **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)	<p>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.</p> <p>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.</p>

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	<p>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.</p> <p>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.</p> <p>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.</p>
Number of participants	144

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

1

2 **Study arms**

3 ***task-oriented gait training (N = 51)***

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

7

8 ***conventional strength training and education only group combined (N = 93)***

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

15

16 **Characteristics**

17 ***Study-level characteristics***

Characteristic	Study (N = 144)
Ethnicity	NR

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

1

2 **Arm-level characteristics**

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

3

1 **Outcomes**2 **Study timepoints**

- 3 • Baseline
- 4 • 12 week
- 5 • 24 week

6

7 **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)	162 (110)	260 (136)	281 (132)	192.5 (110.4)	251.4 (127.1)	263.3 (137.8)
Mean (SD)						
walking speed (Comfortable walking speed) final values (m/s)	0.44 (0.28)	0.75 (0.36)	0.79 (0.36)	0.53 (0.28)	0.53 (0.28)	0.74 (0.36)
Mean (SD)						
Functional mobility measures (timed up and go) final value (seconds)	33.9 (31.1)	20.7 (17.1)	17.6 (12.2)	27.2 (22)	20.71 (18.36)	21.2 (18.7)
Mean (SD)						
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)						

- 1 6 minute walk test - final value - Polarity - Higher values are better
- 2 walking speed (Comfortable walking speed) final values - Polarity - Lower values are better
- 3 Functional mobility measures (timed up and go) final value - Polarity - Lower values are better
- 4 Measures of standing balance (berg balance scle) final values - Polarity - Higher values are better

5

6

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

8 **continuousoutcomes-6minutewalktest-finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only**
 9 **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

10

1 ***continuousoutcomes-6minutewalktest-finalvalue-MeanSD-task-oriented gait training-conventional strength training and education only***
 2 ***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

3

4 ***continuousoutcomes-walkingspeed(Comfortablewalkingspeed)finalvalues-MeanSD-task-oriented gait training-conventional strength***
 5 ***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

6

7 ***continuousoutcomes-walkingspeed(Comfortablewalkingspeed)finalvalues-MeanSD-task-oriented gait training-conventional strength***
 8 ***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

9

1 ***continuousoutcomes-Functionalmobilitymeasures(timedupandgo)finalvalue-MeanSD-task-oriented gait training-conventional strength***
 2 ***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

3

4 ***continuousoutcomes-Functionalmobilitymeasures(timedupandgo)finalvalue-MeanSD-task-oriented gait training-conventional strength***
 5 ***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

6

7 ***continuousoutcomes-Measuresofstandingbalance(bergbalancescle)finalvalues-MeanSD-task-oriented gait training-conventional***
 8 ***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

9

1 **continuousoutcomes-Measuresofstandingbalance(bergbalancescle)finalvalues-MeanSD-task-oriented gait training-conventional**
 2 **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

3

4 **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

5

6 **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

1

2 **Study arms**

3 ***Mobility related circuit class training (N = 28)***

4 Mobility-related CCT including walking, standing tasks focused on balance, sit to stand; 1-h sessions, 3 times/week for 10 weeks

5

6 ***Stretching and slow weight shifting exercises (N = 31)***

7 stretching and slow weight shifting exercises; 1-h sessions, 3 times/week for 10 weeks

8

9 **Outcomes**

10 ***Study timepoints***

- 11 • Baseline
- 12 • 10 week (post intervention)
- 13 • 14 week (1 month retention FU)

14

1 **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)	20.2 (10.8)	16.7 (9.6)	16.9 (10.5)	18.4 (13.1)	17 (10.7)	17.5 (11)
Mean (SD)						
measures of standing balance (berg balance scale) final values 0-59	44.7 (6.5)	49.1 (5)	49 (5.4)	44.8 (7.1)	48.1 (5.7)	47.5 (6)
Mean (SD)						

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

4

5

6 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**7 **Continuous outcomes-Functional mobility measure (timed up and go) final values-Mean SD-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)

1

2 ***Continuousoutcomes-Functionalmobilitymeasure(timedupandgo)finalvalues-MeanSD-Mobility related circuit class training-Stretching***
 3 ***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)

4

5 ***Continuousoutcomes-measuresofstandingbalance(bergbalancescale)finalvalues-MeanSD-Mobility related circuit class training-***
 6 ***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)

7

8 ***Continuousoutcomes-measuresofstandingbalance(bergbalancescale)finalvalues-MeanSD-Mobility related circuit class training-***
 9 ***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)

1

2 **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
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3

4 **Study details**

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

1

2 **Study arms**3 ***Circuit class therapy (N = 12)***

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

6

7 ***No treatment (N = 14)***

8 Wait list control. Concomitant therapy: No additional information.

9

10 **Characteristics**11 ***Arm-level characteristics***

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

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

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

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 9 week (Post-intervention (end of first phase only))

6

7 **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	301.6 (121.5)	23.6 (49.5)	349.1 (124.2)	5.3 (25.8)
Mean (SD)				
Functional mobility measures (timed up and go) - Change scores (seconds) Change scores	13.1 (5.1)	0.4 (2.9)	14.2 (13.7)	0.3 (1.6)
Mean (SD)				

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.	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Mean (SD)				
SIS - Communication	77.1 (25.4)	21.1 (23.4)	86 (18.4)	-3.3 (11.1)
Mean (SD)				
SIS - Emotion	74.3 (12)	9.7 (12.3)	79.9 (15.5)	2.6 (11.9)
Mean (SD)				
SIS - ADL/IADL	81.9 (21.8)	2.9 (10.1)	85 (21.4)	-0.2 (6.2)
Mean (SD)				
SIS - Hand	69.6 (36.1)	6.7 (14)	74.2 (37.6)	-1.2 (9.4)
Mean (SD)				
SIS - Memory	76.8 (27.8)	-2.7 (12.9)	80.5 (21.3)	6 (14.5)
Mean (SD)				
SIS - Mobility	78.2 (17.2)	2.5 (8.2)	75.4 (22.3)	5.3 (11.3)
Mean (SD)				
SIS - Participation	65.4 (25.4)	3.6 (18.6)	76.2 (20.7)	3.4 (16.5)
Mean (SD)				

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	66.7 (25.2)	3.1 (21.1)	62 (28.1)	-3.8 (11)
Mean (SD)				

- 1 6-minute walk test - Change scores - Polarity - Higher values are better
- 2 Functional mobility measures (timed up and go) - Change scores - Polarity - Lower values are better
- 3 Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale) - Change scores - Polarity - Higher values are better

4
5

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

7 **Continuous outcomes-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

8

9 **Continuous outcomes-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

10

1 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Communication-**
 2 **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

3

4 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Emotion-MeanSD-**
 5 **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

6

7 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-ADL/IADL-MeanSD-**
 8 **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

9

1 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Hand-Mean SD-Circuit**
 2 **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

3

4 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Memory-Mean SD-**
 5 **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

6

7 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Mobility-Mean SD-**
 8 **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

9

1 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Participation-Mean SD-**
 2 **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

3

4 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale)-Change scores-SIS-Strength-Mean SD-**
 5 **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

6

7 **Martins, 2017**

Bibliographic Reference Martins, J. C.; Aguiar, L. T.; Nadeau, S.; Scianni, A. A.; Teixeira-Salmela, L. F.; Faria, Cdc; 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

8

9 **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
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study- see primary study for details	
Other publications associated with this study included in review	No additional information.

1

2

3 **Martins, 2020**

Bibliographic Reference	Martins, J. C.; Nadeau, S.; Aguiar, L. T.; Scianni, A. A.; Teixeira-Salmela, L. F.; De Moraes 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
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4

5 **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)	<p>Circuit class training N=18</p> <p>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.</p>

	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	<p>Any other intervention (stretching and memory exercises and education) N=18</p> <p>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.</p>

	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.

1

2 **Study arms**

3 ***Circuit class training (N = 18)***

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

13

14 ***Any other intervention (stretching and memory exercises and education) (N = 18)***

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

1 memory games, remembering the sequence of objects, bingo, speaking names (of animals, food, objects, people and places); singing
 2 passages of music. Health education sessions included information on risk factors for stroke, the importance of correct consumption of
 3 medications and fluid intake, frequency of medical consultations, and quality of sleep. Concomitant therapy: All participants received
 4 60 minute interventions, in groups of two to six, three times a week for 12 weeks, totaling 36 sessions. Both interventions were
 5 provided in health centers and laboratory settings. No task or guidance was provided to participants to be performed at home.

6

7 **Characteristics**

8 ***Arm-level characteristics***

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

1

2 **Outcomes**

3 **Study timepoints**

- 4 • Baseline
- 5 • 12 week (Post-intervention)
- 6 • 16 week (Follow up)

7

8 **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	0.94 (0.34)	0.05 (0.14)	0.03 (0.14)	0.95 (0.38)	0.07 (0.16)	0.03 (0.12)
Mean (SD)						
Stroke-specific Patient-Reported Outcome Measures (SSQOL) - Change scores Scale range: 0-245. Change scores.	191 (39)	9 (14)	7 (23)	184 (29)	-3 (15)	-9 (18)
Mean (SD)						

- 1 6-minute walk test - Change scores - Polarity - Higher values are better
- 2 Walking speed (comfortable walking speed) - Change scores - Polarity - Higher values are better
- 3 Stroke-specific Patient-Reported Outcome Measures (SSQOL) - Change scores - Polarity - Higher values are better

1 **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	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0
No of events						

2 Adverse events - Polarity - Lower values are better

3

4

5 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**6 **Continuous outcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory exercises and education)-t12**
7

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

8

1 ***Continuousoutcomes-6-minutewalktest-Changescores-MeanSD-Circuit class training-Any other intervention (stretching and memory***
 2 ***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

3

4 ***Continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-Changescores-MeanSD-Circuit class training-Any other intervention***
 5 ***(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

6

7 ***Continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-Changescores-MeanSD-Circuit class training-Any other intervention***
 8 ***(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

9

1 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (SSQOL)-Change scores-Mean SD-Circuit class training-Any**
 2 **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

3

4 **Continuous outcomes-Stroke-specific Patient-Reported Outcome Measures (SSQOL)-Change scores-Mean SD-Circuit class training-Any**
 5 **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

6

7 **Dichotomous outcomes-Adverse events-No Of Events-Circuit class training-Any other intervention (stretching and memory exercises and**
 8 **education)-t12**

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

9

1 ***Dichotomous outcomes-Adverse events-No Of Events-Circuit class training-Any other intervention (stretching and memory exercises and***
 2 ***education)-t16***

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

3

4 **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

5

6 **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)

1

2 **Study arms**

3 ***Mobility circuit class training (N = 20)***

4 Mobility CCT based on FAME programme including warm-up, stretching, functional strengthening, balance, agility & fitness, cool
5 down; 45-60 minutes, 3 times/week for 19 weeks

6

7 ***Home based stretching programme (N = 20)***

8 home stretching programme of matched duration; 45 to 60 minutes 3 times/week for 19 weeks

9

10 **Outcomes**

11 ***Study timepoints***

- 12 • Baseline
- 13 • 19 week

14

15 ***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)	428 (131)	512 (131)	419 (127)	441 (126)
Mean (SD)				

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)	1.2 (0.4)	1.5 (0.3)	1.2 (0.3)	1.3 (0.3)
Mean (SD)				
Measures of standing balance (berg balance scale) - final value	50 (4)	55 (2)	50 (5.6)	52 (5)
Mean (SD)				
Stroke-specific Patient-Reported Outcome Measures (Stroke Impact Scale - physical total) 0-100	308 (92)	324 (96)	336 (78)	348 (64)
Mean (SD)				

1 6 minute walk test - final value - Polarity - Higher values are better

2 walking speed - Polarity - Lower values are better

3 Measures of standing balance (berg balance scale) - final value - Polarity - Higher values are better

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

5 **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)	n = 0	n = 0 ; % = 0	<i>empty data</i>	n = 0 ; % = 0
No of events				

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

1

2

3 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**4 **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)

5

6 **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)

7

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

9

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)

10

1 **continuousoutcomes-Stroke-specificPatient-ReportedOutcomeMeasures(StrokeImpactScale-physicaltotal)-MeanSD-Mobility circuit**
 2 **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)

3

4 **Dichotomousoutcomes-Adverseevents(anyadverseevents)-NoOfEvents-Mobility circuit class training-Home based stretching**
 5 **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)

6

7 **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

8

9 **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.
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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

1

2 **Study arms**

3 ***Mobility circuit class training (N = 31)***

4 Mobility CCT, 15 2-min workstations including walking, standing balance and strengthening; 50-60 min 3 times/week for 4 week

5

6 ***Social and education classes only (N = 27)***

7 4 social and 4 educational sessions; duration not specified, twice a week for 4 weeks

8

9 **Outcomes**

10 ***Study timepoints***

- 11 • Baseline
- 12 • 4 week (post intervention)

- 1 • 3 month

2

3 **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)	263 (110)	282 (117)	277 (125)	201 (99)	200 (99)	195 (104)
Mean (SD)						
walking speed (gait speed) - final values (m/s)	0.76 (0.3)	0.79 (0.28)	0.77 (0.26)	0.62 (0.27)	0.63 (0.25)	0.63 (0.25)
Mean (SD)						
Measures of standing balance (Activities specific balance confidence scale) final values 0-100	6.86 (2)	7.36 (1.9)	7.12 (2.1)	6.03 (1.07)	6.42 (1.7)	6.62 (1.7)
Mean (SD)						

4 6 minute walk test - final value - Polarity - Higher values are better

5 walking speed (gait speed) - final values - Polarity - Lower values are better

6 Measures of standing balance (Activities specific balance confidence scale) final values - Polarity - Higher values are better

7

8

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **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

3

4 **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

5

6 **continuousoutcomes-Measuresofstandingbalance(Activitiesspecificbalanceconfidencescale)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

8

1 ***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

2

3 ***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

4

5 ***continuousoutcomes-Measuresofstandingbalance(Activtiesspecificbalanceconfidencescale)finalvalues-MeanSD-Mobility circuit class***
 6 ***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

7

8 **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

1

2 **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	

1

2 **Study arms**

3 ***High intensity circuit class training (N = 23)***

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

6

7 ***Low intensity circuit class training (N = 21)***

8 Low-intensity mobility CCT, based on motor control and balance, no progression of heart rate; 45-60 minutes, 3 times/week for 4
9 weeks in addition to 30 min/day usual care physiotherapy.

10

11 **Outcomes**

12 ***Study timepoints***

- 13 • Baseline
- 14 • 4 week

15

16 ***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	459.8 (145.8)	518.7 (165.2)	401 (131.5)	422.4 (127.9)
Mean (SD)				

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	1.5 (0.5)	1.7 (0.5)	1.4 (0.5)	1.4 (0.4)
Mean (SD)				
Measures of standing balance (Berg balance scale) 0-56 final values	53 (3.3)	54.1 (3)	53.2 (2.3)	54.1 (1.7)
Mean (SD)				

1 Six minute walk test - Polarity - Higher values are better

2 Walking speed (10m walk test) - Polarity - Higher values are better

3 Measures of standing balance (Berg balance scale) - Polarity - Higher values are better

4 **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	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0
No of events				

5 Adverse events - Polarity - Lower values are better

6

7

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **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)

3

4 **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)

5

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

7

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)

8

1 **Continuous outcomes-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)

2

3 **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

4

5 **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

1

2 **Study arms**

3 ***Mobility-related circuit class training (N = 32)***

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

6

7 ***Seated upper extremity program (N = 31)***

8 Upper-limb-related exercise training including strengthening, range of motion, functional reach and manipulation tasks; 1-h session, 3
9 times/week for 19 weeks.

10

1 **Outcomes**2 **Study timepoints**

- 3 • Baseline
- 4 • 19 week

5

6 **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)

7 6 minute walk test - final value - Polarity - Higher values are better

8 Measures of standing balance (Berg balance scale) final value - Polarity - Higher values are better

9 Measures of motor impairment (paretic leg muscle strength) final value - Polarity - Higher values are better

1 **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)	n = 0 ; % = 0	n = 4 ; % = 12.5	n = 0 ; % = 0	n = 1 ; % = 3.2
No of events				

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

3
4

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

6 **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

7

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

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

10

1 ***continuousoutcomes-Measuresofmotorimpairment(pareticlegmusclestrength)finalvalue-MeanSD-Mobility-related circuit class training-***
 2 ***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

3

4 ***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 <i>(Does not mention staff:pt ratio)</i>

5

6 **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

7

8 **Study details**

Secondary publication of another included	
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study- see primary study for details	
Other publications associated with this study included in review	<p>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.</p> <p>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.</p>
1	
2	
3	
Qurat ul, 2018	
Bibliographic Reference	<p>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</p>
4	
5	
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

1

2 **Study arms**3 ***Task specific circuit gait training (N = 18)***

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

1

2 **Traditional gait training (N = 18)**

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

5

6 **Outcomes**

7 **Study timepoints**

- 8 • Baseline
- 9 • 6 week

10

11 **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	31.6 (6.62)	51 (6.39)	35.13 (9.28)	41.26 (8.89)
Mean (SD)				

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

13

14

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **Continuous outcomes - measures of standing balance (berg balance scale) final values - Mean SD - Task specific circuit gait training - Traditional**
3 **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)

4

5 **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

6

7 **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.

1

2 **Study arms**3 ***Task specific circuit gait training (N = 18)***

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

9

1 **Traditional gait training (N = 18)**

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

4

5 **Characteristics**6 **Study-level characteristics**

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

Characteristic	Study (N = 36)
Nominal	

1

2 **Outcomes**

3 **Study timepoints**

- 4 • Baseline
- 5 • 6 week

6

7 **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)	26.01 (8.5)	16.57 (7.1)	29.51 (9.5)	26.22 (12.3)
Mean (SD)				

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

9

10

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

2 **Continuous outcomes-Functional mobility measures (timed up and go) final value-Mean SD-Task specific circuit gait training-Traditional gait**
 3 **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)

4

5 **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

6

7 **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.

8

9

1 **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

2

3 **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	<p>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.</p> <p>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</p>
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.

1

2 **Study arms**3 ***Circuit class training (N = 11)***

4 Mobility CCT, provided in circuit. 30 min/day, 3 times/week for 4 weeks. Inpatient rehabilitation. Staff:participant ratio: not specified.

5 Concomitant therapy: No additional information.

6

7 ***Any other intervention (mobility CCT provided individually and conventional therapy) (N = 19)***

8 1 group (n=10) receiving mobility exercises, provided one-to-one. 1 group (n=9) receiving conventional therapy (not described).

9 Concomitant therapy: No additional information.

10

11 **Characteristics**12 ***Arm-level characteristics***

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

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

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 4 week (Post-intervention)

6

1 **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)

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

3

4

5 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**6 **Continuous outcomes - Walking speed (velocity) - Final values - Mean SD - 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)

8

1 **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

2

3 **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.

1

2 **Study arms**3 ***Circuit class training (N = 25)***

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

6

7 ***Any other intervention (balance and stretching exercises) (N = 25)***

8 Balance and flexibility non-aerobic, including balance exercise progressed to be challenging. 60-min sessions 3 times/week for 6
9 months. Staff:participant ratio: 3:12. Concomitant therapy: No additional information.

10

11 **Characteristics**12 ***Arm-level characteristics***

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

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

1

2 **Outcomes**3 ***Study timepoints***

- 4 • Baseline
- 5 • 6 month (Post-intervention)

6

1 **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)

2 6-minute walk test - Final values - Polarity - Higher values are better

3 **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

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

5

6

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **Continuous outcomes-6-minute walk test-Final values-Mean SD-Circuit class training-Any other intervention (balance and stretching**
3 **exercises)-t6**

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

4

5 **Dichotomous outcome-Adverse events (falls)-No of Events-Circuit class training-Any other intervention (balance and stretching**
6 **exercises)-t6**

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

7

8 **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

9

10 **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-Riksförbundet 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

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

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.

1

2 **Study arms**3 ***Circuit class therapy with education (N = 34)***

4 Circuit class training conducted twice weekly over a 3 month period. Included the following sessions: a warm-up that consisted of
5 stationary cycling or walking (10 minutes), a circuit class (approximately 45 minutes) and a motivational session that included
6 discussions about issues and personal goals that are related to physical activity (20 minutes). The exercises were retrieved from the
7 high-intensity functional exercises program. The resistance exercises used were performed at a low (>15 repetitions) to moderate (10-
8 15 repetitions) intensity and were intended to improve strength and muscular endurance. Motivational groups after each training
9 session were used to complement the exercise program. This included discussions with a physiotherapist for 20 minutes about
10 physical activity behaviour and risk factor modifications with targeted questions about the barriers and facilitators to physical activity. A
11 follow-up that targeted the compliance of the one daily at-home exercise was also included. Concomitant therapy: No additional
12 information.

13

14 ***Any other intervention (usual care) (N = 33)***

15 Continue with regular activities. Were not restricted from participating in ordinary physical activities and rehabilitation programs.
16 Concomitant therapy: No additional information.

17

1 **Characteristics**2 **Arm-level characteristics**

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

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

1

2 **Outcomes**3 **Study timepoints**

- 4 • Baseline
- 5 • 3 month (Post-intervention)
- 6 • 15 month (Follow-up)

7

1 **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.	0.68 (0.26)	0.068 (0.27)	0.034 (0.28)	0.67 (0.26)	0.001 (0.28)	0.044 (0.3)
Mean (SD)						
6-minute walk test - Change scores (meters) Change scores.	328.2 (115)	33.5 (82)	-29 (114.2)	361.6 (98.4)	5.3 (47.8)	-0.5 (85.9)
Mean (SD)						
Walking speed (10 metre walk test) - Change scores (m/s) Change scores.	1 (0.35)	0.1 (0.23)	0.08 (0.37)	1.08 (0.3)	-0.02 (0.16)	0 (0.25)
Mean (SD)						
Functional mobility measures (Short Physical Performance Test) - Change scores Scale range: 0-12. Change scores.	8.2 (3)	1 (2.8)	1.3 (2.4)	8.5 (2.5)	0.15 (1.1)	0.7 (2.4)
Mean (SD)						

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)

- 1 Person/participant generic health-related quality of life (EQ-5D) - Change scores - Polarity - Higher values are better
- 2 6-minute walk test - Change scores - Polarity - Higher values are better
- 3 Walking speed (10 metre walk test) - Change scores - Polarity - Higher values are better
- 4 Functional mobility measures (Short Physical Performance Test) - Change scores - Polarity - Higher values are better
- 5 Measures of standing balance (Berg Balance Scale) - Change scores - Polarity - Higher values are better

6 ***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						

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

2

3

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

5 **Continuous outcomes - Person/participant generic health-related quality of life (EQ-5D) - Change scores - Mean SD - 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

7

8 **Continuous outcomes - Person/participant generic health-related quality of life (EQ-5D) - Change scores - Mean SD - 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

10

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

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

3

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

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

6

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

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

9

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

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

3

4 ***Continuousoutcomes-Functionalmobilitymeasures(ShortPhysicalPerformanceTest)-Changescores-MeanSD-Circuit class therapy with***
 5 ***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

6

7 ***Continuousoutcomes-Functionalmobilitymeasures(ShortPhysicalPerformanceTest)-Changescores-MeanSD-Circuit class therapy with***
 8 ***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

9

1 **Continuous outcomes-Measures of standing balance(Berg Balance Scale)-Changescores-MeanSD-Circuit class therapy with education-Any**
 2 **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

3

4 **Continuous outcomes-Measures of standing balance(Berg Balance Scale)-Changescores-MeanSD-Circuit class therapy with education-Any**
 5 **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

6

7 **Dichotomous outcome-Adverse events(withdrawal due to adverse events)-No Of Events-Circuit class therapy with education-Any other**
 8 **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)

9

1 ***Dichotomous outcome-Adverse events (withdrawal due to adverse events)-No Of Events-Circuit class therapy with education-Any other***
 2 ***intervention (usual care)-t15***

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

3

4 **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

5

6 **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)

1

2 **Study arms**

3 ***Circuit training (N = 126)***

4

5 ***Usual care (N = 124)***

6

7 **Outcomes**

8 ***Study timepoints***

- 9 • Baseline
- 10 • 12 week
- 11 • 24 week

12

13 ***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)	339 (120)	412 (117)	416 (118)	306 (135)	354 (145)	366 (151)
Mean (SD)						

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)	0.9 (0.3)	1.1 (0.3)	1.1 (0.3)	0.8 (0.4)	0.89 (0.36)	0.94 (0.39)
Mean (SD)						
Functional mobility measures (timed up and go) - final values (seconds)	15 (10)	11 (7)	11 (8)	18 (19)	15 (16)	14.6 (13.79)
Mean (SD)						
Measures of standing balance (Timed balance test) final value 0-5	3.65 (1.05)	4.06 (1.02)	3.82 (1.45)	3.46 (1.11)	3.74 (1.06)	3.36 (1.52)
Mean (SD)						

- 1 6-minute walk test - final value - Polarity - Higher values are better
- 2 walking speed (comfortable walk test) - final values - Polarity - Higher values are better
- 3 Functional mobility measures (timed up and go) - final values - Polarity - Lower values are better
- 4 Measures of standing balance (Timed balance test) final value - Polarity - Higher values are better

5

6

1 **Critical appraisal - Cochrane Risk of Bias tool (RoB 2.0) Normal RCT**2 **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

3

4 **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

5

6 **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

7

1 **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

2

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

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

4

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

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

6

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

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

1

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

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

3

4 **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
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5

6 **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.

1

2

3 **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

4

5 **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	

1

2 **Study arms**

3 ***Mobility circuit class training (N = 15)***

4 Workstations including balance, stair walking, turning, transfers, and speed walking plus mental imagery

5

6 ***Conventional lower limb therapy (N = 15)***

7 Conventional lower limb therapy based on Bobath techniques

8

9 **Outcomes**

10 ***Study timepoints***

- 11 • Baseline
- 12 • 2 week (post intervention)
- 13 • 6 week

14

1 **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)

2 6 minute walk test - final values - Polarity - Higher values are better

3 Walking speed (comfortable walking speed) - Polarity - Higher values are better

4 Functional mobility measures (Functional Ambulation Classification) - final values - Polarity - Higher values are better

5 Activities of daily living (brthel index) final values - Polarity - Higher values are better

1 **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

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

3

4

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

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

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

8

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

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

3

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

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

6

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

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

9

1 ***continuousoutcomes-Functionalmobilitymeasures(FunctionalAmbulationClassification)-finalvalues-MeanSD-Mobility circuit class***
 2 ***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

3
 4 ***continuousoutcomes-Functionalmobilitymeasures(FunctionalAmbulationClassification)-finalvalues-MeanSD-Mobility circuit class***
 5 ***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

6
 7 ***continuousoutcomes-Walkingspeed(comfortablewalkingspeed)-MeanSD-Mobility circuit class training-Conventional lower limb therapy-***
 8 ***t2***

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

9

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

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

3

4 ***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

5

6 ***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

7

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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

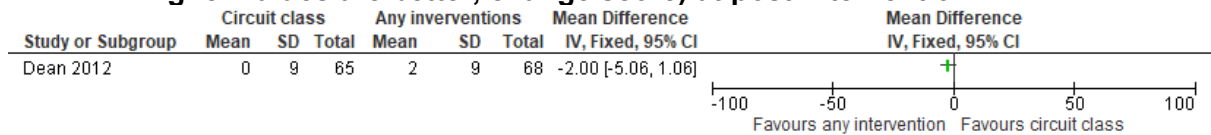


Figure 3: Person/participant generic health-related quality of life (SF-12 MCS, 0-100, higher values are better, change score) at post-intervention

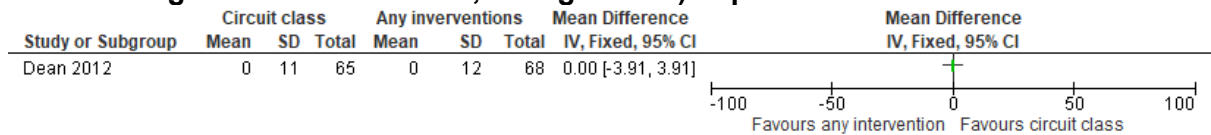


Figure 4: Person/participant generic health-related quality of life (AQOL, unclear range, higher values are better, final value) at post-intervention

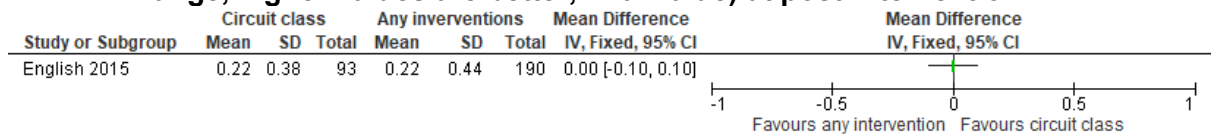


Figure 5: Person/participant generic health-related quality of life (EQ5D-5L, -0.11-1, higher values are better, final value) at follow up

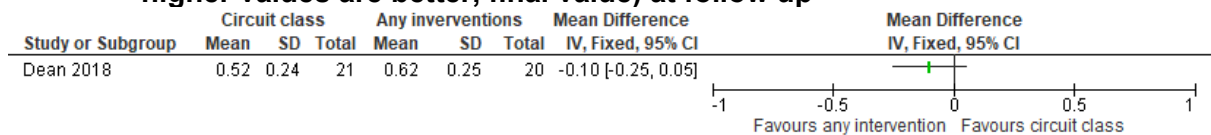


Figure 6: Six minute walk test ([meters] higher values are better, change scores and final values) at post-intervention

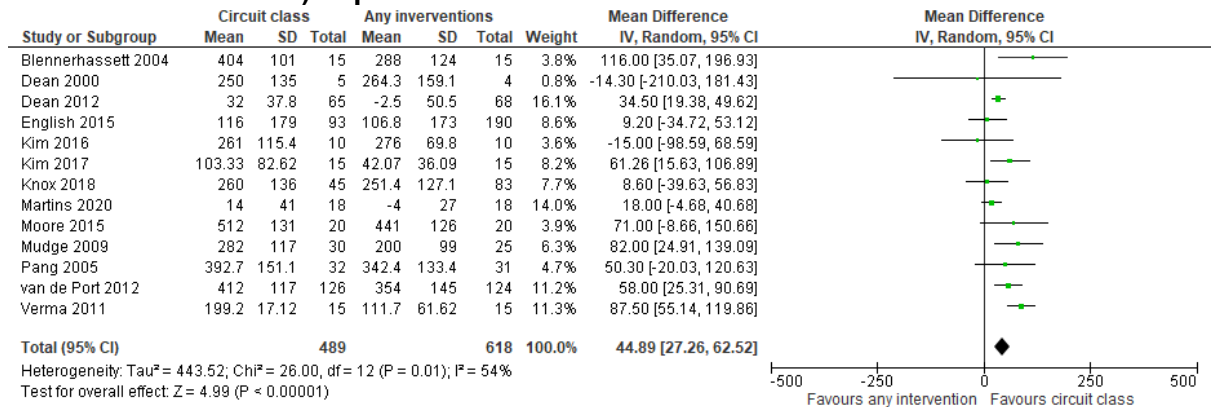


Figure 7: Six minute walk test ([meters], higher values are better, change scores and final values) at follow up

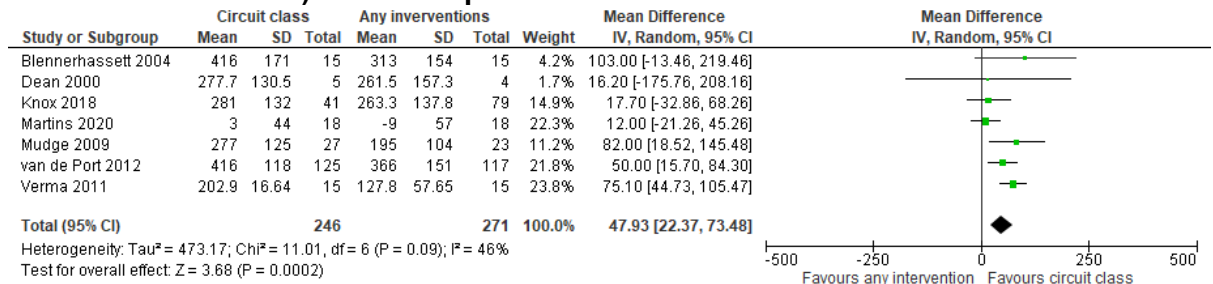


Figure 8: Walking speed (10 meter walk test, comfortable walk test, [m/s], higher values are better, change scores) at post-intervention

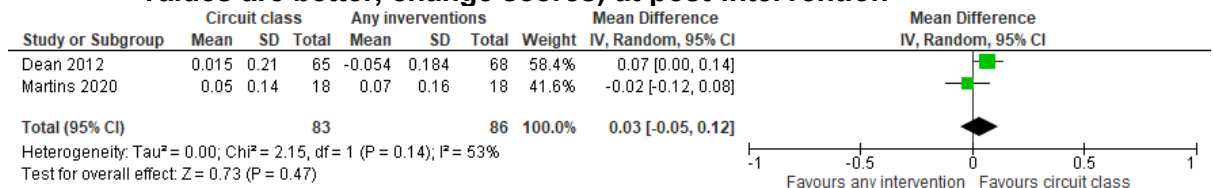


Figure 9: Walking speed (10 meter walk test, gait speed, comfortable walk test [m/s], higher values are better, final values) at post-intervention

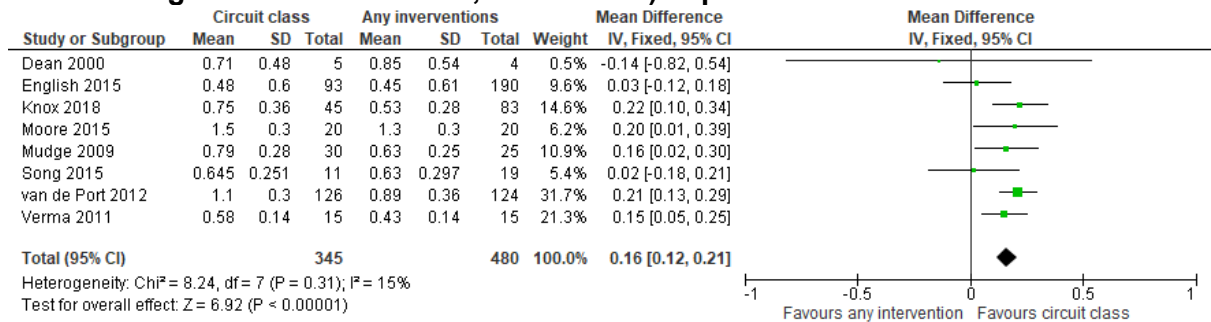


Figure 10: Walking speed (10 meter walk test, unclear units, higher values are better, final value) at post-intervention

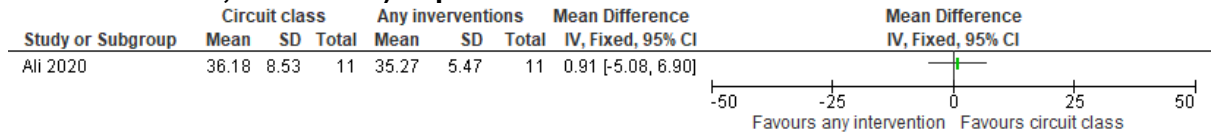


Figure 11: Walking speed (comfortable walking speed, [m/s], higher values are better, change score) at follow up

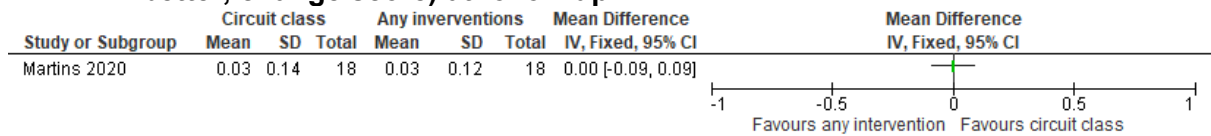


Figure 12: Walking speed (comfortable walk test, gait speed, [m/s], higher values are better, final values) at follow up

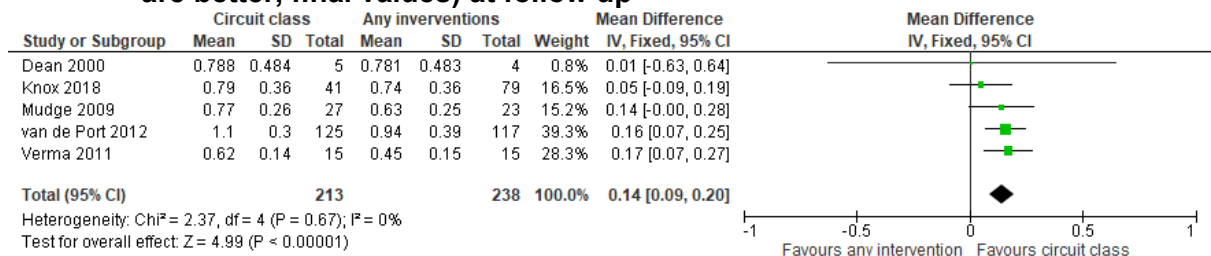


Figure 13: Functional mobility measures (timed up and go [seconds], lower values are better, change scores and final values) at post-intervention

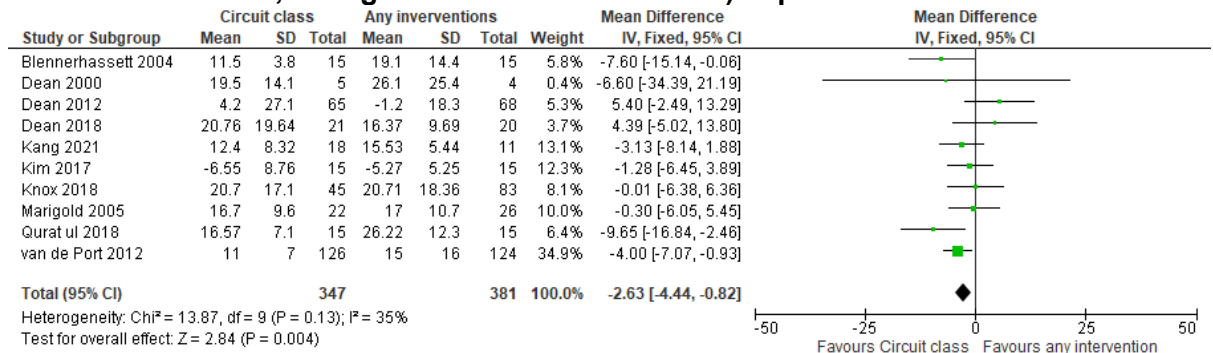


Figure 14: Functional mobility measures (Functional Ambulation Classification, FMA-LL [different scale ranges], higher values are better, final values) at post-intervention

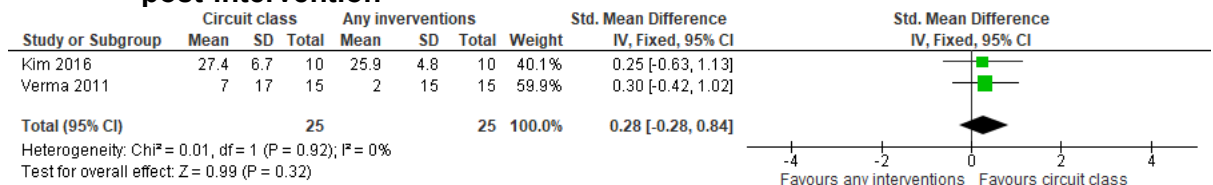


Figure 15: Functional mobility measures (timed up and go [seconds], lower values are better, final values) at follow up

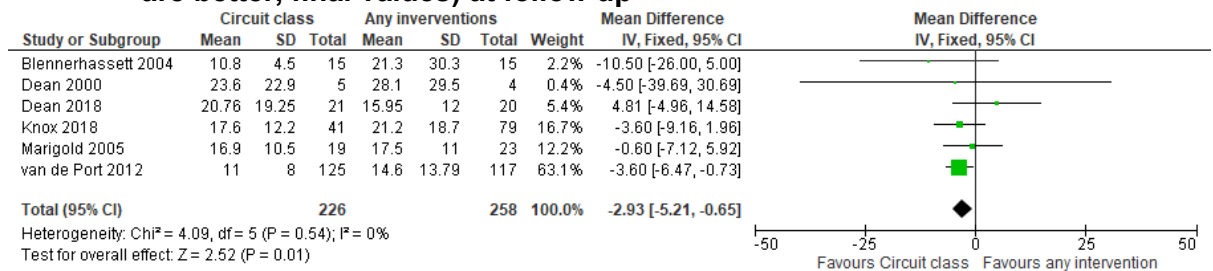


Figure 16: Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at post-intervention

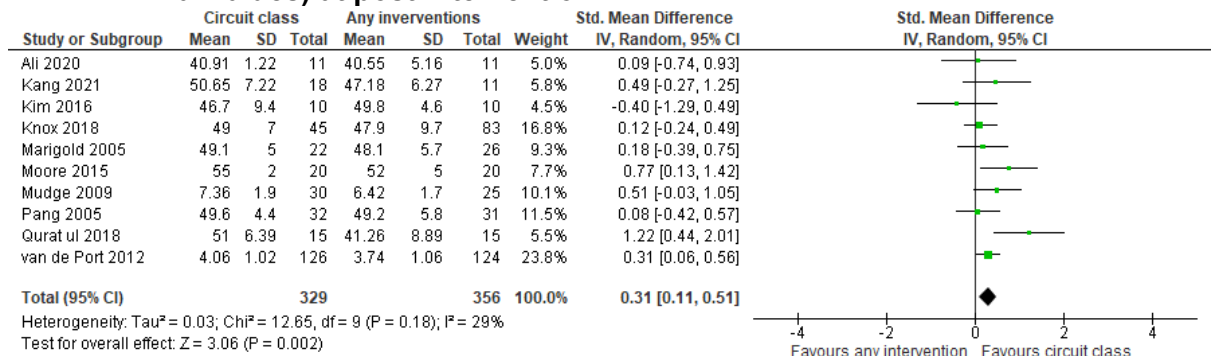


Figure 17: Measures of standing balance (step test [number of steps], higher values are better, change score and final value) at post-intervention

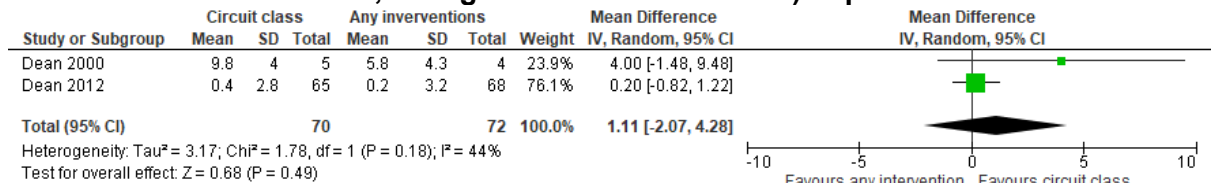


Figure 18: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change scores) at post-intervention

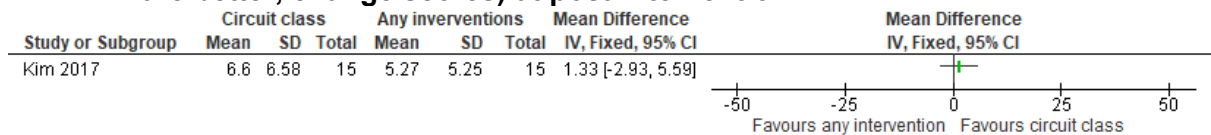


Figure 19: Measures of standing balance (Berg balance scale, balance confidence scale, timed balance test [different scales ranges], higher values are better, final values) at follow up

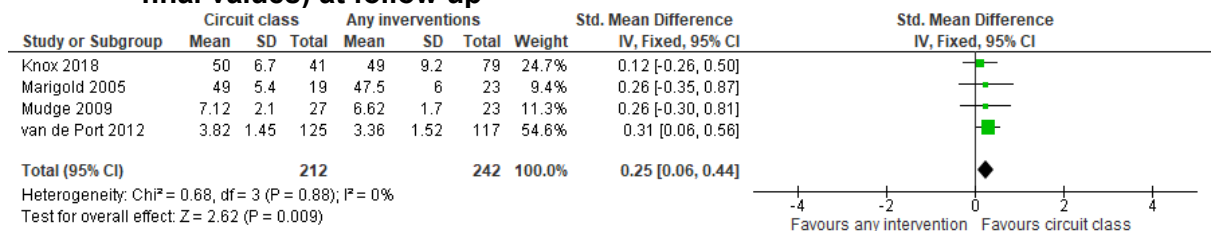


Figure 20: Measures of motor impairment (affected knee strength [kg], higher values are better, change score) at post-intervention

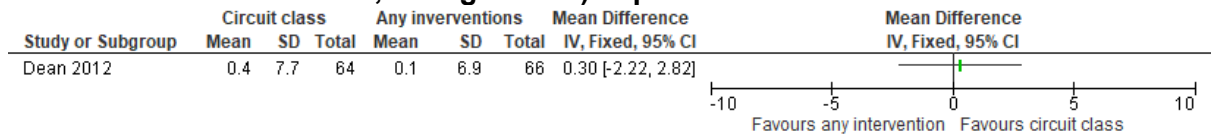


Figure 21: Measures of motor impairment (paretic leg muscle strength [newtons], higher values are better, final value) at post-intervention

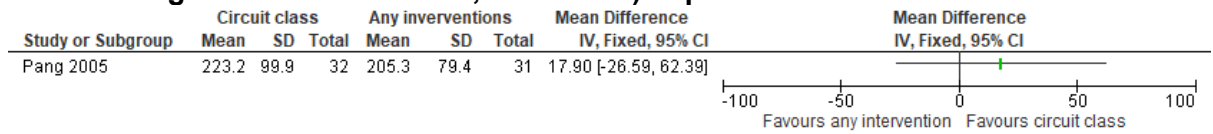


Figure 22: Measures of motor impairment (K-trunk impairment scale, 0-23, higher values are better, final value) at post-intervention

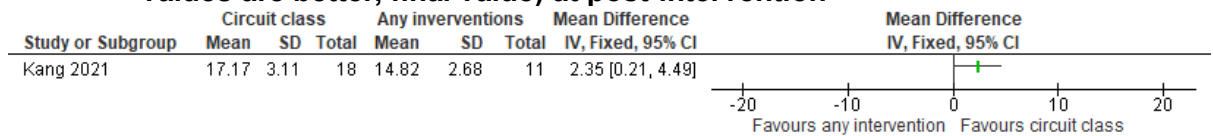


Figure 23: Activities of daily living (Barthel index, FIM [different scale ranges], higher are better, final values) at post-intervention

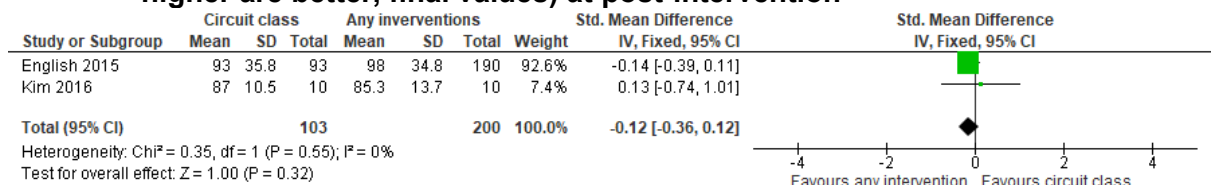


Figure 24: Activities of daily living (Barthel index, 0-100, higher are better, final value) at follow up

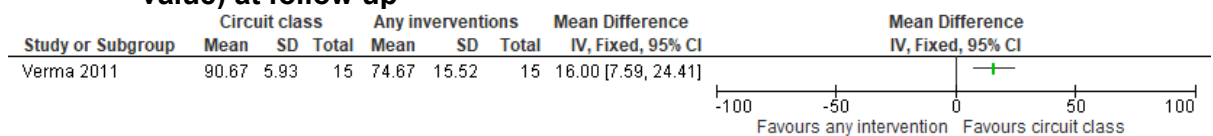


Figure 25: Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, change score) at post-intervention

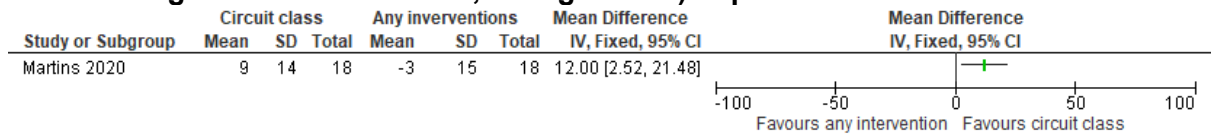


Figure 26: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - physical domain, different scale ranges, higher values are better, final values) at post-intervention

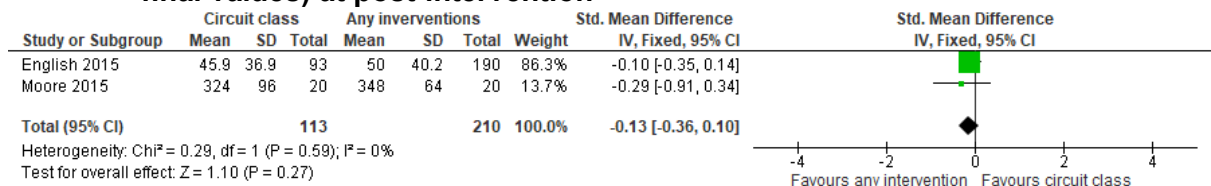


Figure 27: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - recovery score, 0-100, higher values are better, final value) at post-intervention

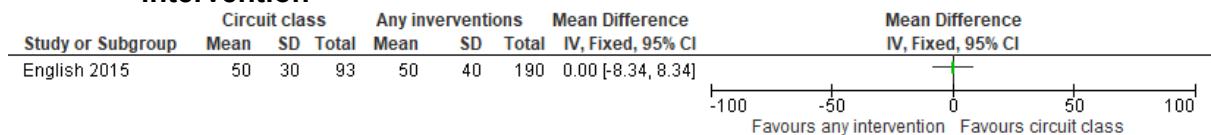


Figure 28: Stroke-specific Patient-Reported Outcome Measures (SSQOL, 0-245, higher values are better, final value) at follow up

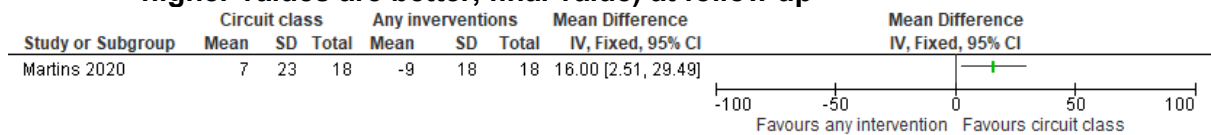


Figure 29: Stroke-specific Patient-Reported Outcome Measures (SSQOL, unclear scale range, higher values are better, final value) at follow up

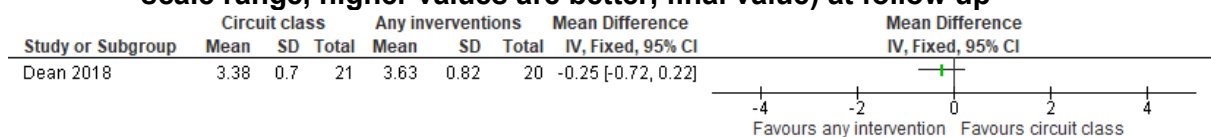


Figure 30: Length of hospital stay ([days], lower values are better, final value) at post-intervention

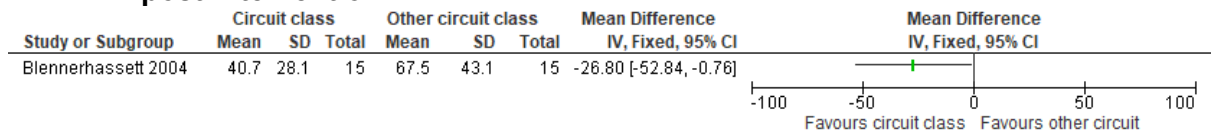


Figure 31: Adverse events at post-intervention

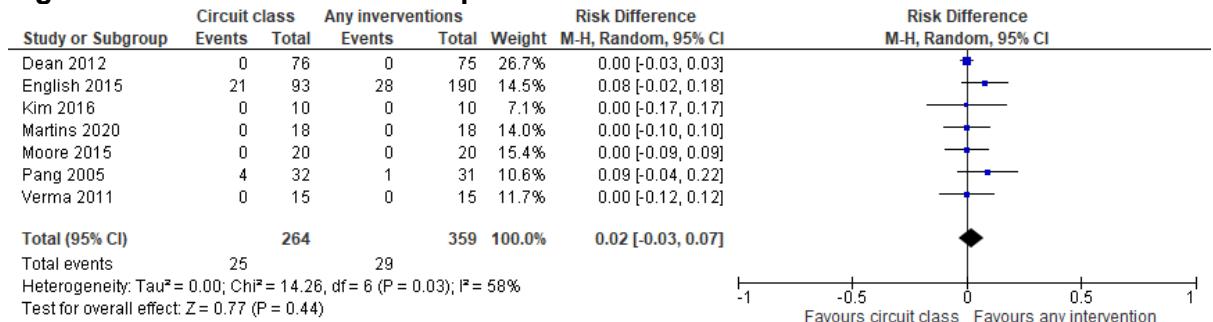
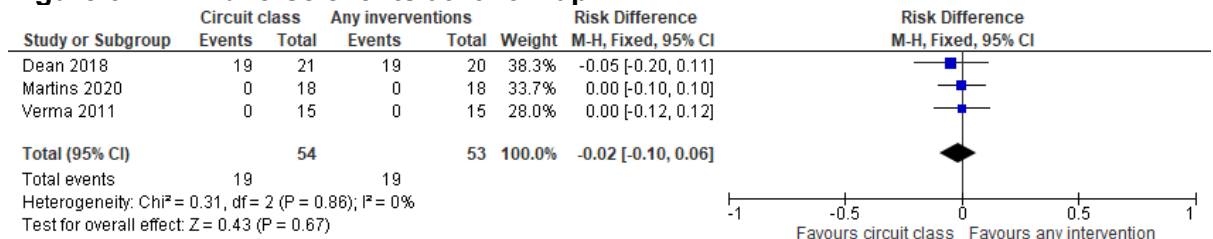


Figure 32: Adverse events at follow up



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

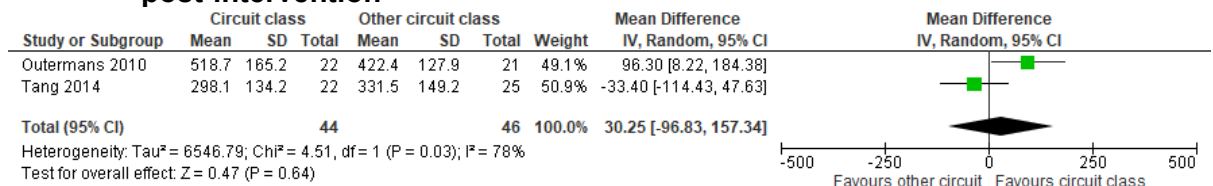


Figure 34: Walking speed (10m walk test [m/s], higher values are better, final values) at post-intervention

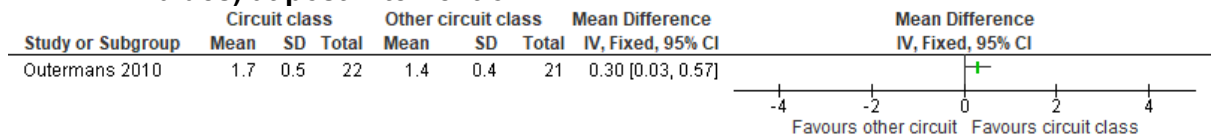


Figure 35: Measures of standing balance (Berg balance scale, 0-56, higher values are better, final value) at post-intervention

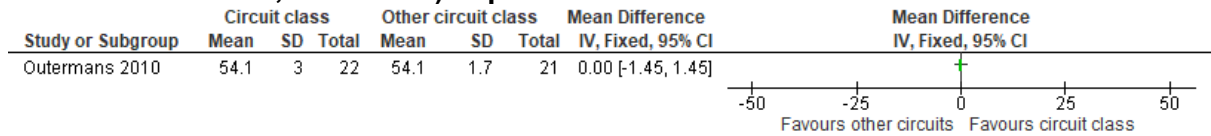
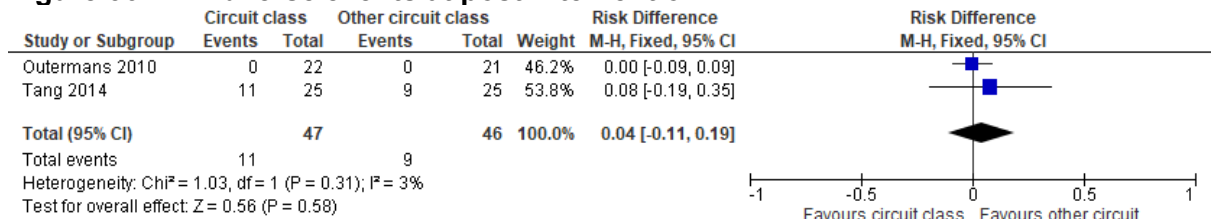


Figure 36: Adverse events at post-intervention



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

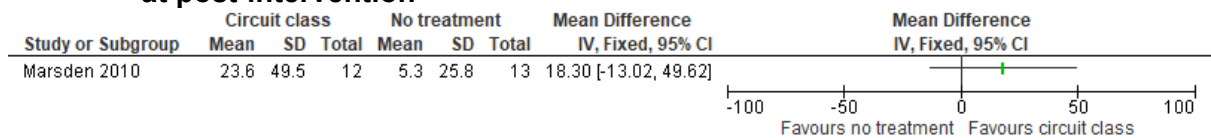


Figure 38: Functional mobility measures (timed up and go [seconds], lower values are better, change score) at post-intervention

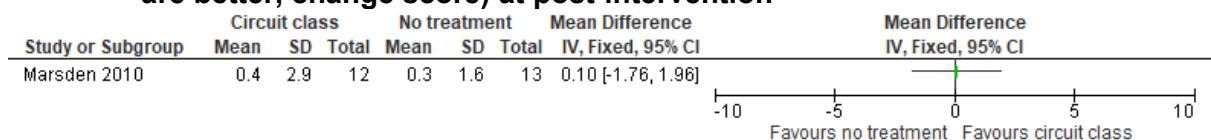


Figure 39: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - communication, 0-100, higher values are better, change score) at post-intervention

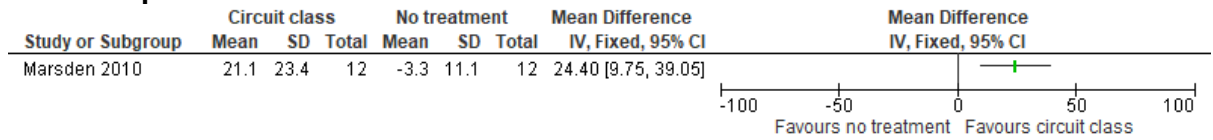


Figure 40: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - emotion, 0-100, higher values are better, change score) at post-intervention

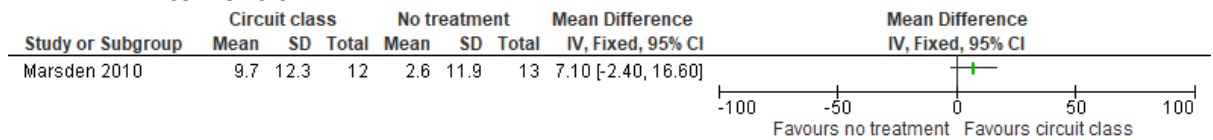


Figure 41: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - ADL, 0-100, higher values are better, change score) at post-intervention

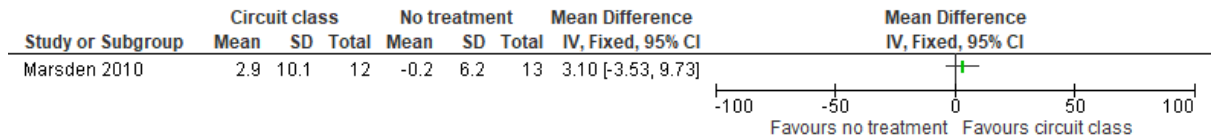


Figure 42: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - hand, 0-100, higher values are better, change score) at post-intervention

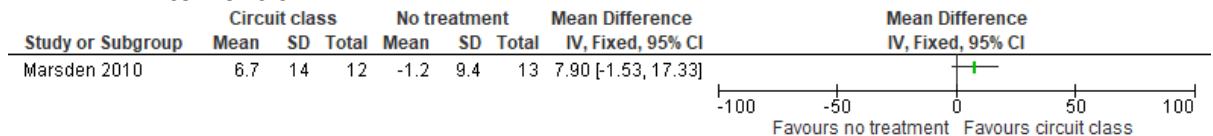


Figure 43: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - memory, 0-100, higher values are better, change score) at post-intervention

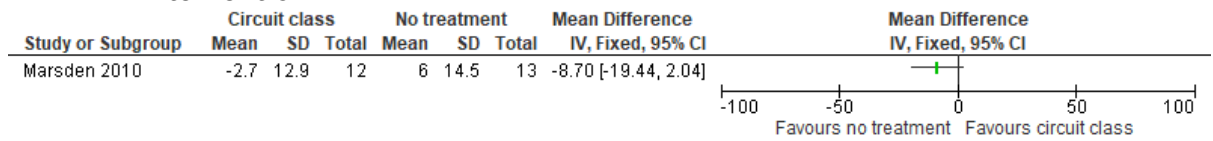


Figure 44: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - mobility, 0-100, higher values are better, change score) at post-intervention

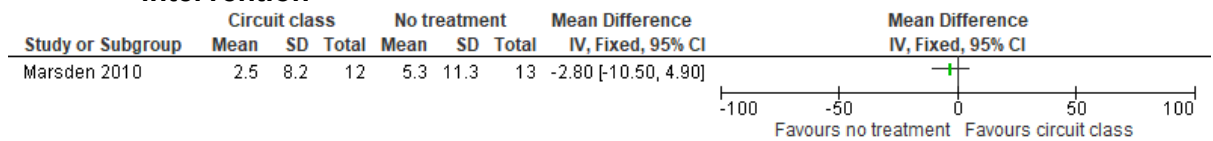


Figure 45: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - participation, 0-100, higher values are better, change score) at post-intervention

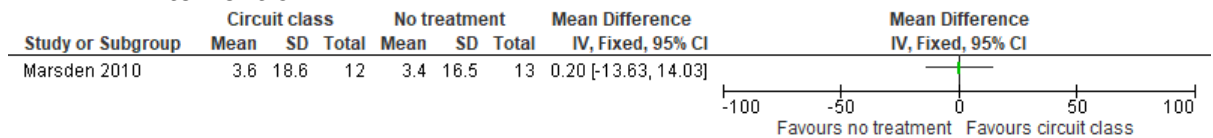
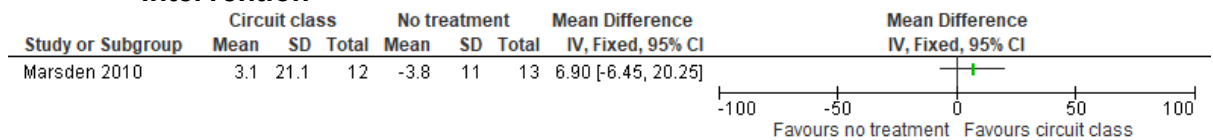


Figure 46: Stroke-specific Patient-Reported Outcome Measures (Stroke impact scale - strength, 0-100, higher values are better, change score) at post-intervention



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

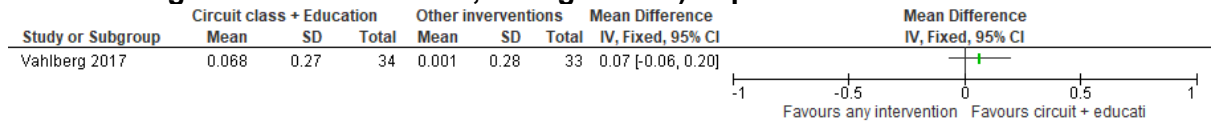


Figure 48: Person/participant generic health-related quality of life (SF-36 PCS, 0-100, higher values are better, final value) at post-intervention

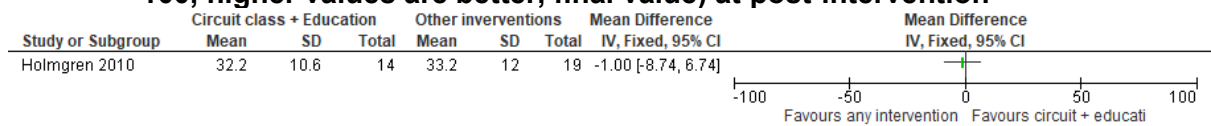


Figure 49: Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at post-intervention

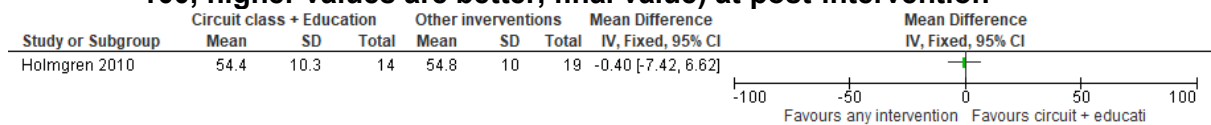


Figure 50: Person/participant generic health-related quality of life (EQ5D, -0.11-1, higher values are better, change score) at follow up

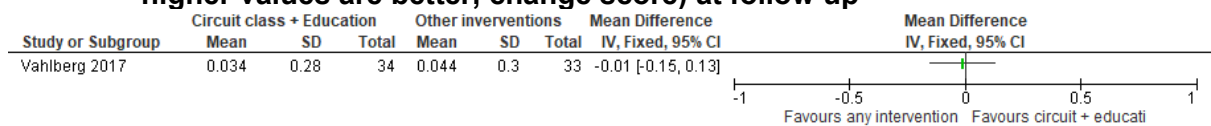


Figure 51: Person/participant generic health-related quality of life (SF-36 - PCS, 0-100, higher values are better, final value) at follow up

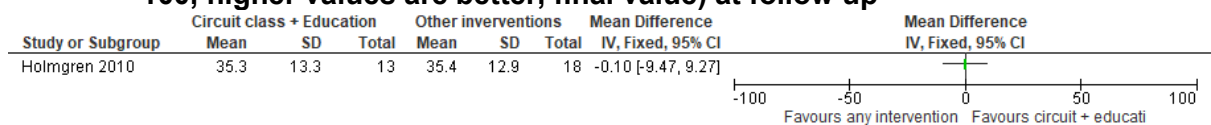


Figure 52: Person/participant generic health-related quality of life (SF-36 MCS, 0-100, higher values are better, final value) at follow up

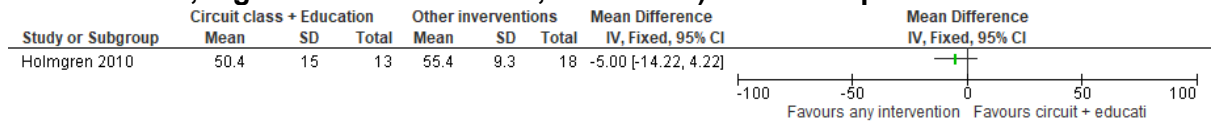


Figure 53: Six minute walk test ([meters], higher values are better, change score) at post-intervention

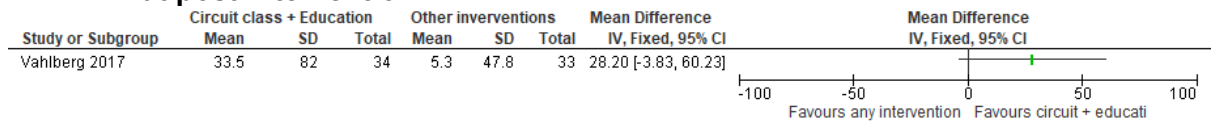


Figure 54: Six minute walk test ([meters], higher values are better, change score) at follow up

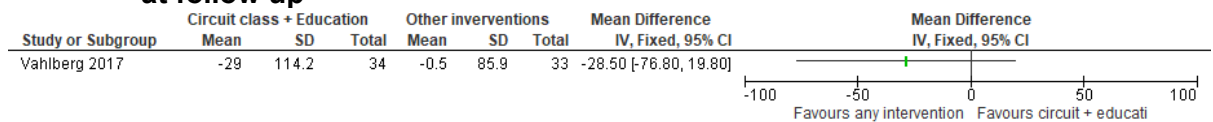


Figure 55: Walking speed (10m walk test [m/s], higher values are better, change score) at post-intervention

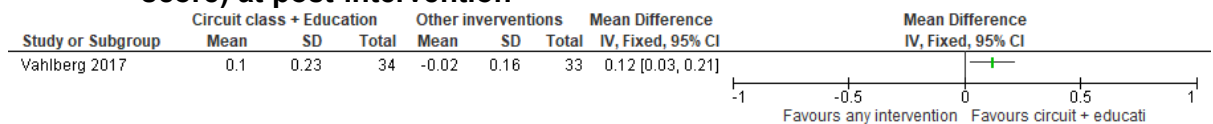


Figure 56: Walking speed (10m walk test [m/s], higher values are better, change score) at follow up

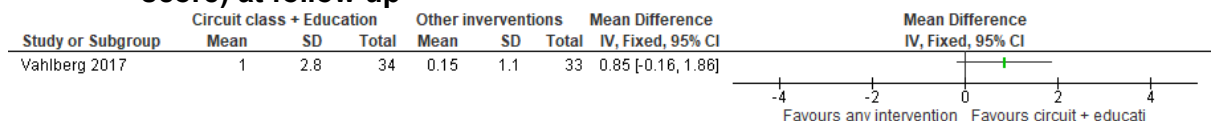


Figure 57: Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at post-intervention

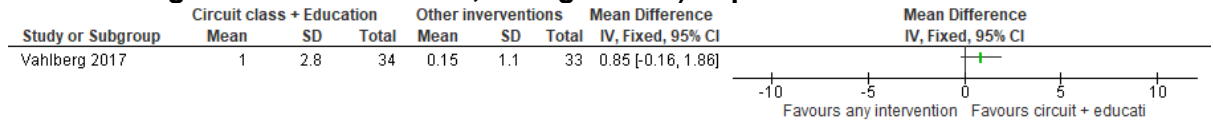


Figure 58: Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention

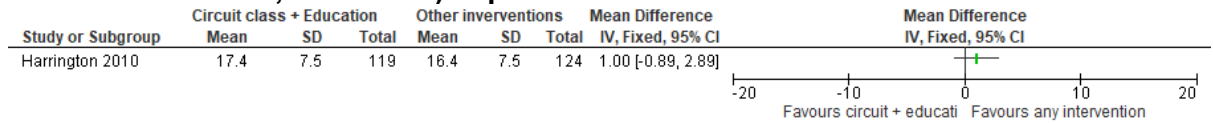


Figure 59: Functional mobility measures (short physical performance test, 0-12, higher values are better, change score) at follow up

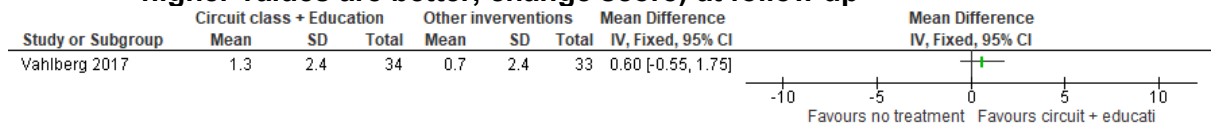


Figure 60: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at post-intervention

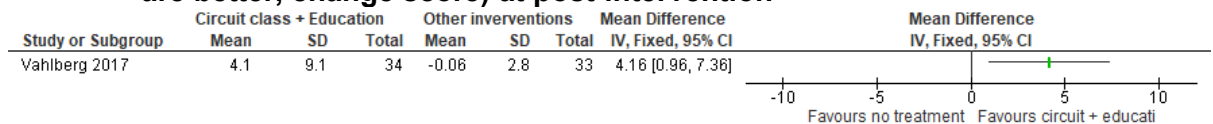


Figure 61: Measures of standing balance (Berg balance scale, 0-56, higher values are better, change score) at follow up

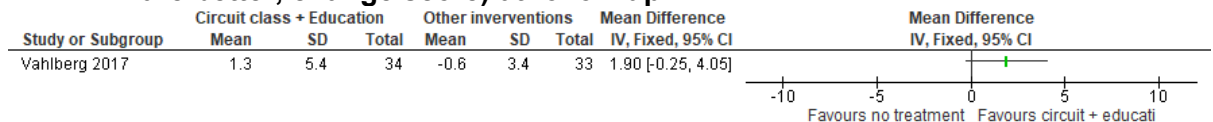


Figure 62: Adverse events (withdrawal due to adverse events) at post-intervention

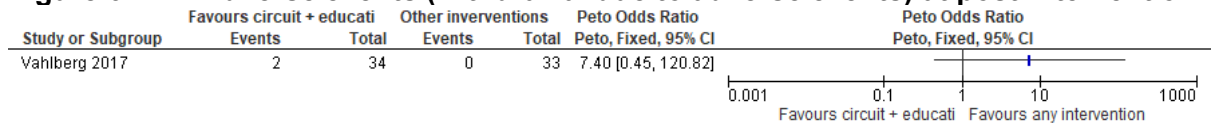
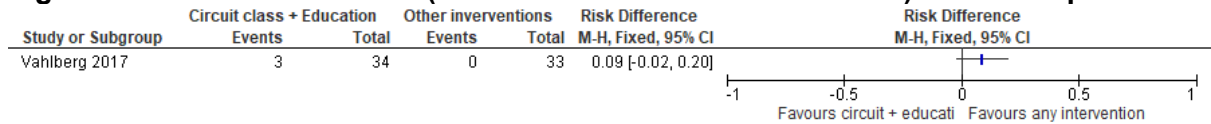
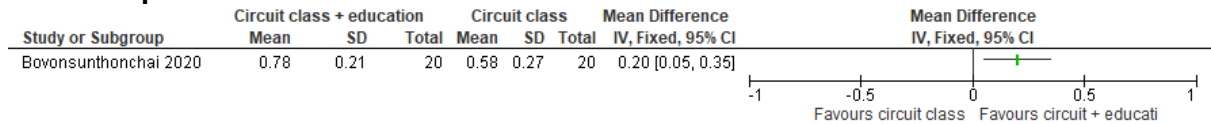


Figure 63: Adverse events (withdrawal due to adverse events) at follow up



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



1 Appendix F – GRADE tables

2 Table 8: Clinical evidence profile: Circuit class therapy compared to any other intervention

Certainty assessment							No of patients		Effect		Certainty	Importance
No 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)												
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

Certainty assessment							No of patients		Effect		Certainty	Importance
No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
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 ^a	serious ^f	not serious	serious ^e	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 ^e	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 ^e	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 ^a	not serious	not serious	not serious	none	18	18	-	MD 0 m/s (0.09 lower to 0.09 higher)	⊕⊕⊕○ Moderate	CRITICAL

Walking speed (comfortable walk test, gait speed [m/s], higher values are better, final values) at follow up (follow-up: mean 14.8 weeks)

Certainty assessment							No of patients		Effect		Certainty	Importance
No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
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 ^a	not serious	not serious	not serious	none	347	381	-	MD 2.63 seconds fewer (4.44 fewer to 0.82 fewer)	⊕⊕⊕○ Moderate	CRITICAL
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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
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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 ⁱ	not serious	not serious	not serious	none	226	258	-	MD 2.93 seconds lower (5.21 lower to 0.65 lower)	⊕⊕○○ Low	CRITICAL
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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 ^a	not serious	not serious	not serious	none	329	356	-	SMD 0.3 SD higher (0.15 higher to 0.45 higher)	⊕⊕⊕○ Moderate	CRITICAL
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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)

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
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Certainty assessment							No of patients		Effect		Certainty	Importance
No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		

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 ^a	not serious	serious ^b	serious ^c	none	15	15	-	MD 1.33 higher (2.93 lower to 5.59 higher)	⊕○○○ Very low	CRITICAL
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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 ^d	not serious	not serious	not serious	none	212	242	-	SMD 0.25 SD higher (0.06 higher to 0.44 higher)	⊕⊕○○ Low	CRITICAL
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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
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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
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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 ^a	not serious	serious ^b	serious ^c	none	18	11	-	MD 2.35 higher (0.21 higher to 4.49 higher)	⊕○○○ Very low	CRITICAL
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Activities of daily living (Barthel index, FIM [different scale ranges], higher are better, final values) at post-intervention (follow-up: mean 4 weeks)

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
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
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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 ^a	not serious	not serious	serious ^c	none	18	18	-	MD 12 higher (2.52 higher to 21.48 higher)	⊕○○○ Very low	CRITICAL
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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
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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
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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 ^a	not serious	not serious	serious ^c	none	18	18	-	MD 16 higher (2.51 higher to 29.49 higher)	⊕○○○ Very low	CRITICAL
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Stroke-specific Patient-Reported Outcome Measures (SSQOL, unclear scale range, higher values are better, final value) at follow up (follow-up: 9 months)

Certainty assessment							No of patients		Effect		Certainty	Importance
No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	circuit class therapy	any other intervention	Relative (95% CI)	Absolute (95% CI)		
1	randomised trials	very serious ^d	not serious	not serious	serious ^e	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 ^e	none	15	15	-	MD 26.8 days fewer (52.84 fewer to 0.76 fewer)	⊕⊕⊕○ Moderate	CRITICAL
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Adverse events at post-intervention (follow-up: mean 14.5 weeks)

7	randomised trials	serious ^e	serious ^{lm}	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
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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
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1 CI: confidence interval; MD: mean difference; SMD: standardised mean difference

2 Explanations

- 3 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)
- 4 b. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)
- 5 c. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs
- 6 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)
- 7 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)

- 1 f. Downgraded by 1 increment because heterogeneity, unexplained by subgroup analysis
- 2 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)
- 3 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)
- 4 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)
- 5 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)
- 6 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)
- 7 l. Absolute effect calculated by risk difference due to zero events in at least one arm of one study
- 8 m. Downgraded for heterogeneity due to conflicting number of events in different studies (zero events in one or more studies)
- 9 n. Downgraded by 2 increments for imprecision due to zero events and small sample size
- 10
- 11

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							No of patients		Effect		Certainty	Importance
No 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 ^a	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 ^a	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) ^a	⊕○○○ Very low	CRITICAL
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1 CI: confidence interval; MD: mean difference

2 Explanations

- 3 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)
- 4 b. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs
- 5 c. Downgraded by 1 increment due to intervention indirectness (does not state staff: participant ratio)
- 6 d. Downgraded by 2 increments for imprecision due to zero events and small sample size
- 7 e. Absolute effect calculated by risk difference due to zero events in at least one arm of one study

8

9 Table 10: Clinical evidence profile: Circuit class therapy compared to no treatment

Certainty assessment							No of patients		Effect		Certainty	Importance
No 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
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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
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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
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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
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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
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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
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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
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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
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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
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1 CI: confidence interval; MD: mean difference

2 Explanations

3 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)

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

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1 **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							No of patients		Effect		Certainty	Importance
No 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
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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
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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
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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
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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
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Functional mobility measures (timed up and go [seconds], lower values are better, final value) at post-intervention (follow-up: 9 weeks)

Certainty assessment							No of patients		Effect		Certainty	Importance
No 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
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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
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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
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Adverse events (withdrawal due to adverse events) at post-intervention (follow-up: 3 months)

1	randomised trials	very serious ^a	not serious	serious ^a	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
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Adverse events (withdrawal due to adverse events) at follow up (follow-up: 15 months)

1	randomised trials	very serious ^a	not serious	serious ^a	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
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CI: confidence interval; MD: mean difference

1 Explanations

- 2 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)
- 3 b. Downgraded by 1 increment if the confidence interval crossed one MID or by 2 increments if the confidence interval crossed both MIDs
- 4 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)
- 5 d. Downgraded by 1 increment due to intervention indirectness (the participant : staff ratio was not stated by the study)
- 6 e. Downgraded by 1 increment due to outcome indirectness (reports withdrawal due to adverse events rather than all adverse events)
- 7 f. Downgraded by 1 increment for imprecision due to zero events and small sample size
- 8 g. Absolute effect calculated by risk difference due to zero events in at least one arm of one study

10

11 **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

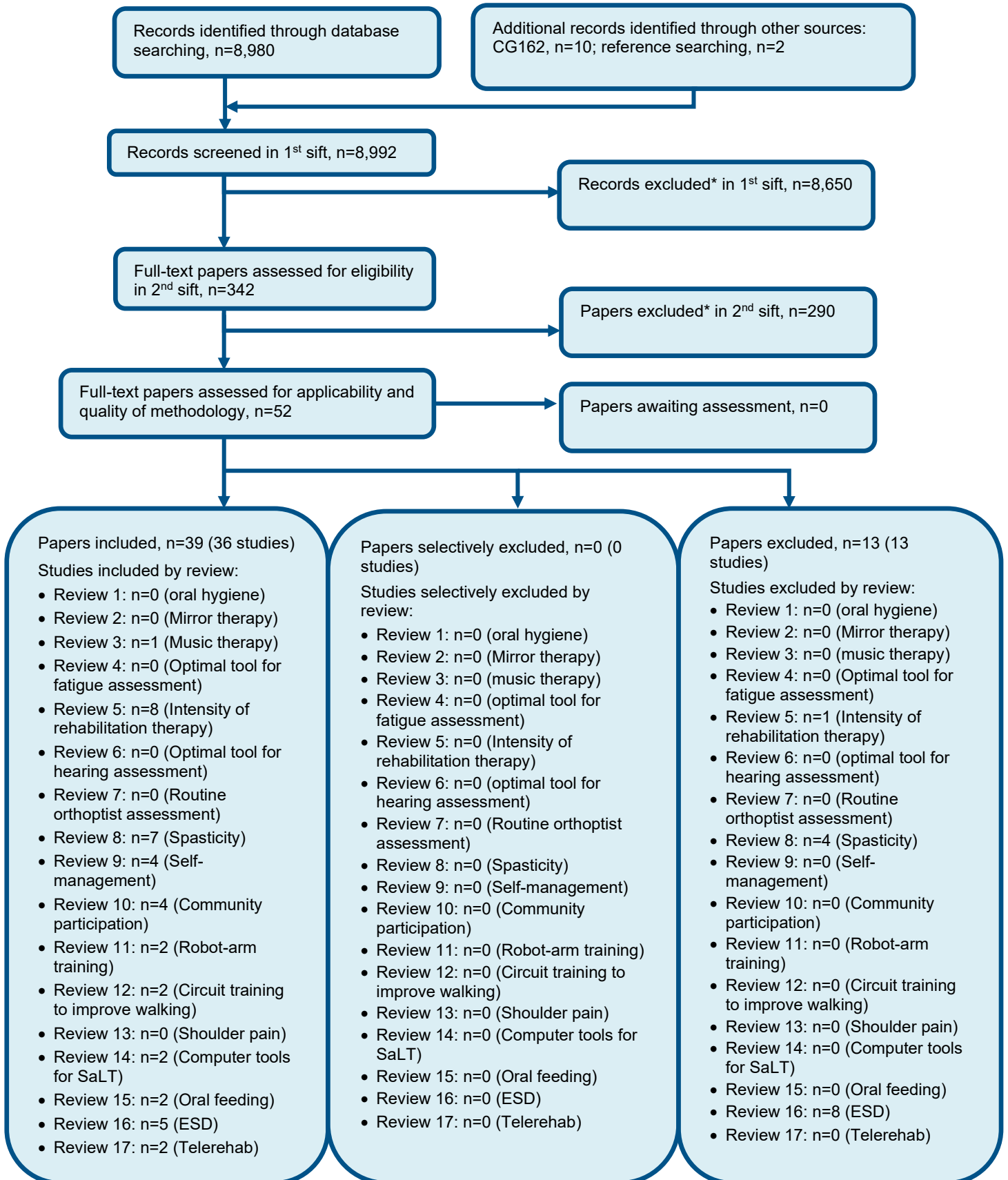
12 CI: confidence interval; MD: mean difference

13 Explanations

- 14 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.)
- 15 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{, #4070}			
Study details	Population & interventions	Costs	Health outcomes	Cost effectiveness
<p>Economic analysis: Cost-utility analysis (health outcome: QALYs)</p> <p>Study design: Within-RCT analysis (Dean 2018{, #4070}).</p> <p>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.</p> <p>Perspective: UK. It is not stated that an NHS and PSS perspective is taken however, the costs included are all</p>	<p>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.</p> <p>Patient characteristics: N = 45 Mean age (SD): 70.5 (11.1) years Male: 66%</p> <p>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.</p> <p>Intervention 2: Circuit based training (ReTrain program) (n=23). Circuit class training</p>	<p>Total costs (mean per patient): Intervention 1: NR Intervention 2: NR</p> <p>Incremental (2-1): £777 (95%CI: NR, p=NR)</p> <p>Currency & cost year: 2016 UK pounds (£)</p> <p>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).</p>	<p>From the clinical review (2-1) – same paper:</p> <p>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)</p> <p>QALY difference (2-1): -0.045^(c).</p> <p>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)</p> <p>Other outcomes were reported and can be seen in clinical evidence table.</p>	<p>ICER (Intervention 2 versus Intervention 1): Dominated by usual care (higher costs and lower QALYs).</p> <p>Probability Intervention 2 is cost effective (£20K threshold): n/a</p> <p>Analysis of uncertainty: None.</p>

<p>considered relevant if the intervention is funded by the NHS.</p> <p>Follow-up: 9 months Treatment effect duration:^(a) 9 months Discounting: n/a</p>	<p>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.</p>			
Data sources				
<p>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).</p>				
Comments				
<p>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 £649¹) 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.</p>				
<p>Overall applicability:^(d) Partially applicable Overall quality:^(e) Potentially serious limitations</p>				

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 ¹²			
Study details	Population & interventions	Costs	Health outcomes	Cost effectiveness
<p>Economic analysis: Cost-consequence analysis (CC) (various health outcomes).</p> <p>Study design: Within-RCT analysis (Harrington 2010¹²).</p> <p>Approach to analysis: Analysis of individual-level healthcare resource use collected at baseline, 9 weeks and 6 months for both groups. Unit costs applied.</p> <p>Perspective: UK NHS and PSS</p> <p>Follow up: 12 months.</p>	<p>Population: Adults with stroke living in the community for at least three months.</p> <p>Patient characteristics: N = 243 Mean age: 70.5 years (SD: 10.3) Male: 54.3%</p> <p>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</p>	<p>Total costs (mean per patient): Intervention 1: £2,994 Intervention 2: £3,741</p> <p>Incremental (2–1): £746 (95%CI: –£432 to £1,924; p=NR)</p> <p>Currency & cost year: 2005 UK pounds (£)</p> <p>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</p>	<p>From the clinical review (2-1);¹²</p> <p>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)</p>	<p>ICER (Intervention 2 versus Intervention 1): n/a</p> <p>Probability Intervention 2 is cost effective (£20K threshold): n/a</p> <p>Analysis of uncertainty: None.</p>

<p>Treatment effect duration:^(a) 12 months Discounting: n/a</p>	<p>they returned home. In all areas stroke survivors were invited to a six-month review.</p> <p>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.</p>	<p>worker time). See Error! Reference source not found. for cost breakdown between intervention groups.</p>		
<p>Data sources</p>				
<p>Health outcomes: Within-RCT analysis of a trial included in clinical review (Harrington 2010)¹² 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.</p>				
<p>Comments</p>				
<p>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.</p>				
<p>Overall applicability:^(c) Partially applicable Overall quality:^(d) Potentially serious limitations</p>				

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 2010¹²

	Mean (SD) cost per participant (£)		Mean cost difference (95% CI) (£)
	Control	Intervention	
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

1 **Appendix I – Health economic model**

2 Modelling was not prioritised for this question.

3

1 Appendix J – Excluded studies

2 Clinical studies

3 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 <i>Does not specifically look at circuit based exercises. References checked.</i>
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 <i>Dual task training compared to standardised trunk care regime - does not appear to be circuit based exercises</i>
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. <i>Biomedicine (India)</i> 40(3): 363-366	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not mention circuit based training - does not appear to be group based, does not mention staffing ratio</i></p>
Arabzadeh, S., Goljaryan, S., Salahzadeh, Z. et al. (2018) Effects of a task-oriented exercise program on balance in patients with hemiplegia following stroke. <i>Iranian Red Crescent Medical Journal</i> 20(1)	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>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.</i></p>
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. <i>BMJ Open</i> 8(3): e021490	<p>- Protocol only</p>
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. <i>Clinical Rehabilitation</i> 33(1): 54-63	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>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.</i></p>
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. <i>Pm & R</i> 10(4): 398-409	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Different definition of circuit based exercise</i></p>

Study	Code [Reason]
	<i>to that used in the English 2017 review and different from that used in our protocol. References checked.</i>
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 <i>Not circuit based training - not group based, no information about staffing ratio</i>
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 <i>Single arm non-randomised study</i>
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 <i>Contextual transferability analysis</i>
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	<i>Single arm non-randomised study</i>
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 <i>Does not specifically look at circuit based training</i>
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 <i>Not obviously circuit based - no mention of group based activity or staffing ratio</i>
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 <i>Not obviously circuit based - no mention of group based activity or staffing ratio</i>
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 <i>Outcomes were related to oxygen consumption, heart rate or biochemical measures</i>
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. <i>Medicina</i> 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. <i>Frontiers in neurology</i> [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. <i>Trials</i> [Electronic Resource] 19(1): 168	- Protocol only <i>Protocol for Lim 2019</i>
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. <i>Osong Public Health and Research Perspectives</i> 9(5): 225-230	- Population not relevant to this review protocol <i>People with upper limb weakness rather than lower limb problems (intervention is focused on upper limb problems only)</i>
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. <i>NeuroRehabilitation</i> 45(1): 87-97	- Data not reported in an extractable format or a format that can be analysed <i>Outcomes reported as median (interquartile range)</i>
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. <i>Technology & Health Care</i> 27(2): 159-165	- Study does not contain an intervention relevant to this review protocol <i>Not circuit based exercise, not group based</i>
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. <i>Stroke</i> 49(12): 2990-2998	- Duplicate reference

Study	Code [Reason]
<p>Pang, M. Y. C., Yang, L., Ouyang, H. et al. (2018) Dual-Task Exercise Reduces Cognitive-Motor Interference in Walking and Falls After Stroke. <i>Stroke</i> 49(12): 2990-2998</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit class training. Insufficient participant:staff ratio.</i></p>
<p>Pogrebnoy, D. and Dennett, A. (2020) Exercise Programs Delivered According to Guidelines Improve Mobility in People With Stroke: A Systematic Review and Meta-analysis. <i>Archives of Physical Medicine & Rehabilitation</i> 101(1): 154-165</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not specifically investigate circuit based training</i></p>
<p>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. <i>Disability and Health Journal</i> 12(3): 528-532</p>	<p>- Study design not relevant to this review protocol</p> <p><i>Single arm non-randomised study</i></p>
<p>Reynolds, H., Steinfors, S., Tillyard, J. et al. (2021) Feasibility and adherence to moderate intensity cardiovascular fitness training following stroke: a pilot randomized controlled trial. <i>BMC Neurology</i> 21(1): 132</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Intervention does not appear to be circuit based (could be individual or group based)</i></p>
<p>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. <i>Archives of physical medicine and rehabilitation</i> 100(5): 923-930</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit based training (intervention appears to be individual and supervised by a physiotherapist)</i></p>

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. <i>Journal of Rehabilitation Medicine (Stiftelsen Rehabiliteringsinformation)</i> 51(2): 78-88	- Study does not contain an intervention relevant to this review protocol <i>Does not appear to specifically investigate circuit based training</i>
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. <i>Clinical Rehabilitation</i> 32(12): 1569-1580	- Study does not contain an intervention relevant to this review protocol <i>Not circuit based exercise</i>
Suchetha, P. S.; Supriya, B.; Krishna, Kovel Rakesh (2018) Effects of Modified Sit to Stand Training with Mental Practice on Balance and Gait in Post Stroke Patients. <i>Indian Journal of Physiotherapy & Occupational Therapy</i> 12(4): 16-21	- Study does not contain an intervention relevant to this review protocol <i>Not obviously circuit based - no mention of group based activity or staffing ratio</i>
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. <i>BioMed Research International</i> : 1-11	- Study does not contain an intervention relevant to this review protocol <i>Does not specifically investigate circuit based training</i>
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. <i>NeuroRehabilitation</i> 41(1): 151-159	- Study does not contain an intervention relevant to this review protocol <i>Not circuit based therapy, not group based</i>

Study	Code [Reason]
<p>Tetik Aydogdu, Y.; Aydogdu, O.; Inal, H. S. (2018) The Effects of Dual-Task Training on Patient Outcomes of Institutionalized Elderly Having Chronic Stroke. <i>Dementia and geriatric cognitive disorders extra</i>: 328-332</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit based training (no statement if completed in a group)</i></p>
<p>Tramontano, M., Bergamini, E., Iosa, M. et al. (2018) Vestibular rehabilitation training in patients with subacute stroke: A preliminary randomized controlled trial. <i>Neurorehabilitation</i> 43(2): 247-254</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit based training (no statement if completed in a group)</i></p>
<p>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. <i>Functional Neurology</i> 34(1): 7-13</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit based training (no statement if completed in a group)</i></p>
<p>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. <i>Pilot & Feasibility Studies</i> 7(1): 146</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Does not appear to be circuit based training (no statement if completed in a group)</i></p>
<p>Tshiswaka, Daudet Ilunga; Bennett, Crystal; Franklin, Cheyanne (2018) Effects of walking trainings on walking function among stroke survivors: a systematic review. <i>International Journal of Rehabilitation Research</i> 41(1): 1-13</p>	<p>- Study does not contain an intervention relevant to this review protocol</p> <p><i>Systematic review that does not specifically investigate circuit based training</i></p>

Study	Code [Reason]
Van Crieking, 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. <i>Clinical Rehabilitation</i> 33(6): 992-1002	- Study does not contain an intervention relevant to this review protocol <i>Does not specifically investigate circuit based training</i>
Van Wissen, K. and Blanchard, D. (2019) Circuit class therapy for improving mobility after stroke: A Cochrane review summary. <i>International Journal of Nursing Studies</i> 97: 130-131	- Study design not relevant to this review protocol <i>Summary of English 2017, the Cochrane review that this review is based on</i>
Varas Diaz, Gonzalo (2022) Effect of cognitive, impairment-oriented and task-specific interventions on balance and locomotion control. <i>Dissertation Abstracts International: Section B: The Sciences and Engineering</i> 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. <i>Stroke</i> 49(suppl1)	- Conference abstract
Ziyal, Leyla (2018) Me before/me after: A group rehabilitation programme for brain injury survivors.	- Book only

1

2

3 Health Economic studies

4 Published health economic studies that met the inclusion criteria (relevant population,
5 comparators, economic study design, published 2006 or later and not from non-OECD
6 country or USA) but that were excluded following appraisal of applicability and
7 methodological quality are listed below. See the health economic protocol for more details.

1 **Table 15: Studies excluded from the health economic review**

Reference	Reason for exclusion
None.	

2

3