National Institute for Health and Care Excellence

Final

Stroke rehabilitation in adults (update)

[E3] Evidence reviews for intensity of rehabilitation

NICE guideline NG236

Evidence reviews underpinning recommendations 1.2.15 to 1.2.22 and recommendations for research in the NICE guideline

October 2023

Final

These evidence reviews were developed by NICE

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

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Contents

Appendices

Appendix A – Review protocols

Review protocol for the clinical and cost-effectiveness of more intensive rehabilitation after a stroke

ID	Field	Content
0.	PROSPERO registration number	CRD42021257080
1.	Review title	In people after stroke, what is the clinical and cost effectiveness of more intensive rehabilitation compared with standard rehabilitation?
2.	Review question	3.1a In people after stroke, what is the clinical and cost effectiveness of more intensive rehabilitation compared with standard rehabilitation? 3.1b In people after stroke what factors are associated with effective delivery of more intensive rehabilitation
3.	Objective	To determine whether more intensive rehabilitation improves outcomes for people after a stroke (including people with communication difficulties, such as aphasia), and what factors may be associated with effective delivery of more intensive rehabilitation.
4.	Searches	The following databases (from inception) will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Epistemonikos • PsychINFO • CINAHL • AMED • PEDRO Searches will be restricted by: • English language studies • Human studies Other searches: • Inclusion lists of systematic reviews

		The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review. Medline search strategy to be quality assured using the PRESS evidence-based checklist (see methods chapter for full details).
5.	Condition or domain being studied	Adults and young people (16 or older) after a stroke

6.	Population	Inclusion:
		• Adults (age ≥16 years) who have had a first or recurrent stroke (including people with communication difficulties)
		  ○ Without communication difficulties
		  ○ With communication difficulties
		• Family members of adults who have had a first or recurrent stroke
		• Carers supporting adults after a first or recurrent stroke
		• Healthcare professionals supporting adults after a first or recurrent stroke
		• Voluntary sector professionals supporting adults after a first or recurrent stroke
		
		Exclusion:
		• Children (age <16 years)
		• People who have had a transient ischaemic attack

7.	Intervention and phenomena of interest	Quantitative data
		• Rehabilitation (inpatient and outpatient) therapy/therapies delivered by any members of a multidisciplinary team at different intensities
		  ○ Stratified by two categories:
		  ○ Minutes/Hours of rehabilitation per day (24 hour period)*
		  – ≤45 minutes
		  – >45 minutes to 1 hour
		  – >1-2 hours
		  – >2-4 hours
		  – >4 hours
		  ○ Number of days of treatment per week
		  – <5 days a week
		  – 5 days a week

		– 6 days a week – 7 days a week *Where an intervention does not compare the number of minutes/hours or rehabilitation per day directly, an average number of minutes/hours per day will be calculated from the available information and included in the relevant category as indirect evidence. Where studies include a mixture of the above categories studies will be included if at least 80% satisfy the criteria for one category. If <10% of participants are in a different category (for example: 9% receive rehabilitation <5 days a week, 91% receive rehabilitation 5 days a week), this study will be included in the majority category without downgrading for indirectness. If 10-20% are in a different category, this study will be included in the majority category and downgraded for intervention indirectness. Qualitative data Views, opinions and experiences relating to how intensively rehabilitation should be delivered (including the potential barriers and facilitators) Themes will be gathered from the evidence identified for this review and not stated prior to this. Topics may include (but will not be limited to): • When, how often and for how long intensive rehabilitation should be available for • Barriers to completing more intensive rehabilitation • Facilitators to completing more intensive rehabilitation
8.	Comparator/Confounding factors	Quantitative data • Different numbers of minutes/hours of rehabilitation per day • Different numbers of days of treatment per week • Different numbers of minutes/hours of rehabilitation per day and different numbers of days of treatment per week (only used where both the number of minutes/hours per day and days of treatment per week changes) • Usual care* *Usual care is only to be used when a) usual care is offered to both study arms (therefore, investigating the effect of an additional intervention that will require additional time), b) a study does not define the number of hours/days per week of the control intervention but defines the intervention offered as usual care.

		Confounding factors (for non-randomised studies only): • Presence of comorbidities • Stroke severity • Age • Time period since stroke Qualitative date N/A

9.	Types of study to be included	Quantitative data
		• Systematic reviews of RCTs
		• Parallel RCTs
		• Cluster randomised trials
		• Cluster randomised crossover trials (unit of randomisation = stroke unit)
		• Crossover trials (for people after chronic stroke only)
		• Non-randomised studies (if insufficient RCT evidence is available)
		  ○ Prospective cohort studies
		  ○ Retrospective cohort studies
		Published NMAs and IPDs will be considered for inclusion.
		
		Non-randomised studies will only be included if all of the key confounders have been accounted for in a multivariate analysis. In the absence of multivariate analysis, studies that account for key confounders with univariate analysis or matched groups will be considered.
		
		Qualitative data
		
		Qualitative interview and focus group studies (including studies using grounded theory, phenomenology or other appropriate qualitative approaches).
		
		Survey data or other types of questionnaires will only be included if they provide analysis from open-ended questions, but not if they reported descriptive quantitative data only.

10.	Other exclusion criteria	• Non-English language studies • Crossover RCTs (for people after acute/subacute stroke) • Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available • Very early mobilisation (discussed in the acute stroke guideline) • People in the first 24 hours after stroke (discussed in the acute stroke guidance)

11.	Context	People after a stroke. This may include people in a hyperacute (<72 hours), an acute (72 hours – 7 days), subacute (7 days – 6 months) or chronic (>6 months) time horizon.

12.	Primary outcomes (critical outcomes)	All outcomes are considered equally important for decision making and therefore have all been rated as critical:
		At time period:
		• <6 months
		• ≥6 months
		
		If multiple outcomes are reported before or after these time period then the latest time period that is ≤6 months or >6 months will be extracted and used in the analysis.
		
		• Person/participant generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
		  ○ EQ-5D
		  ○ SF-6D
		  ○ SF-36
		  ○ SF-12
		  ○ Other utility measures (AQOL, HUI, 15D, QWB)
		  ○ Other quality of life measures (including stroke-specific quality of life measures. In this case communication-specific measures of quality of life will be extracted with priority for people with communication difficulties)
		• Carer generic health-related quality of life (continuous outcomes will be prioritised [validated measures])
		  ○ EQ-5D
		  ○ SF-6D
		  ○ SF-36
		  ○ SF-12
		  ○ Other utility measures (AQOL, HUI, 15D, QWB)
		• Stroke outcome - modified Rankin scale (continuous outcome)
		• Activities of daily living (continuous outcomes will be prioritised)
		  ○ Barthel Index
		  ○ National Institutes of Health Stroke Scale
		  ○ Orpington Prognostic Scale
		  ○ Canadian Occupational Performance Measure
		  ○ Extended activities of daily living
		• Physical function (continuous outcomes will be prioritised)

		○ Physical function – upper limb – Action Research Arm Test – Chedoke Arm and Hand Activity Inventory – Nine-hole peg test – Motricity Index Scale – Muscle Power Assessment (MRC scale) – Wolf Motor Function Test – Motor Activity Log ○ Physical function – lower limb – Rivermead Motor Assessment – Rivermead Mobility Scale – Berg Balance Scale – 6 minute walk distance – 10 meter walk test – Timed up and go – Walking speed – Motricity Index Scale – Stairs test – Muscle Power Assessment – Stroke Rehabilitation Assessment of Movement – Timed Up and Go – Short Physical Performance Battery – Tinnetti Performance Oriented Mobility Assessment – Dynamic Gait Index – Physical Performance Test – 5-Time Sit-to-Stand • Communication (continuous outcomes will be prioritised) ○ Overall language ability – Western Aphasia Battery – Comprehensive Aphasia Test (CAT) – Boston Diagnostic & Aphasia Examination – Porch Index of Communicative Ability – Frenchay Aphasia Screening Test ○ Impairment specific measures – Naming • Boston Naming Test (BST) • Picture naming test of personally relevant words (bespoke) • Comprehensive Aphasia Test (CAT) naming objects subscale • Object and Action Naming Test – Auditory comprehension • Aachen Aphasia Test, Token Test • Comprehensive Aphasia Test (CAT) Comprehension Test subscale

		– Reading • Comprehensive Aphasia test word reading and/or non-word reading – Expressive language • Comprehensive Aphasia Test picture description – Dysarthria speech impairment • Frenchay Dysarthria Assessment 1 or 2 • Assessment of intelligibility of Dysarthria speech • Acoustic and perceptual measures of voice and speech (e.g. vocal profile analysis, pitch loudness, air flow, sound spectrography) • Iowa Oral Performance Instrument o Functional communication – Aachen Aphasia Test, spoken communication domain score – If dysarthria is the presenting complaint: Therapy Outcome Measures dysarthria activity scale – Amsterdam-Nijmegen Everyday Language Test (ANELT) – Therapy Outcome Measures (TOMs) aphasia activity scale • Psychological distress (continuous outcomes will be prioritised) o Depression (if people have communication difficulties, measures specific to this difficulty will be prioritised, for example for depression: depression intensity scale circles, stroke aphasic depression questionnaire, signs of depression scale, aphasic depression rating scale) – PHQ-9 – Hospital Anxiety and Depression scale - depression subscale – Beck Depression Inventory – Hamilton Depression Scale – Centre of Epidemiologic Studies Depression – GHQ-28 – Geriatric Depression Scale • Stroke-related scale of cognition (continuous outcomes will be prioritised) o Non-spatial attention and working memory – Attention Rating and Monitoring Scale – Cognitive Failures Questionnaire – Any other subjective measures (for example: Rating Scale of Attentional Behaviour, Moss Attention Rating Scale)

		– Objective measures (including: Integrated Visual Auditory Continuous Performance Test-Scale Attention Quotient, Trail Making A and B, The Paced Auditory Serial Attention Test, Colour Word Interference Test/Stroop Test, Wechsler Adult Intelligence Scales, Digit Span subtest, Arithmetic subtest, Letter-Number sequencing subtest, Wechsler spatial span subtest, The California Verbal Learning Test, Cancellation tests, other objective measures) o Spatial attention – Catherine Bergego Scale – Behavioural inattention test – Kessler Foundation Neglect Assessment Process – Everyday Neglect Questionnaire – Any other subjective measures – Objective measures (including: target cancellation, line bisection, the behavioural summary score from the Behavioural Inattention Test, other objective measures) o Memory – Everyday Memory Questionnaire – Any other subjective measures (for example: Memory Assessment Clinics Questionnaire, Internal and External Memory Aids Questionnaires) – Objective measures (including Rivermead Behavioural Memory Test, Wechsler Memory Scale, Cambridge Test for Prospective Memory, Doors and People Memory test, other objective measures) o Executive functions – Dysexecutive Questionnaire/Dysexecutive Questionnaire-revised version (DEX/DEX-R) – Any other subjective measures – Objective measures (including Hayling Test, Brixton Test, Tower of Hanoi/London, Wisconsin Card Sorting Test, Subtests of the Behavioural Assessment of Dysexecutive Syndrome, other objective measures) • Swallow function and ability (continuous outcome) o Functional Oral Intake Scale o Dysphagia Severity Rating Scale o Eating Assessment Tool o Mann Assessment of Swallow Ability o Standardised Swallowing Assessment

		• Discontinuation from study (dichotomous outcomes) If not mentioned above, other validated scores will be considered and discussed with the committee to deliberate on their inclusion. Themes will be gathered from the evidence identified for this review and not stated prior to this. Topics may include (but will not be limited to): • When, how often and for how long intensive rehabilitation should be available for • Barriers to completing more intensive rehabilitation • Facilitators to completing more intensive rehabilitation
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised form will be used to extract data from studies (see Developing NICE guidelines: the manual section 6.4). 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary. Study investigators may be contacted for missing data where time and resources allow. Once saturation is considered to have been reached (all the themes are already covered in the data extraction) data from other included papers will not be extracted or critically appraised, but the paper will still be read to check for any additional themes and

		will be noted in the included studies. The point at which data extraction is reached will be noted within the review.
15.	Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. • Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) • Non randomised study, including cohort studies: Cochrane ROBINS-I • Qualitative studies: Critical Appraisal Skills Programme (CASP) qualitative checklist • Mixed methods synthesis: Mixed methods Appraisal Tool (MMAT)
16.	Strategy for data synthesis	• Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). Fixed-effects (Mantel-Haenszel) techniques will be used to calculate risk ratios for the binary outcomes where possible. Continuous outcomes will be analysed using an inverse variance method for pooling weighted mean differences. Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic and visually inspected. An I^2 value greater than 50% will be considered indicative of substantial heterogeneity. Sensitivity analyses will be conducted based on pre-specified subgroups using stratified meta-analysis to explore the heterogeneity in effect estimates. If this does not explain the heterogeneity, the results will be presented pooled using random-effects. • GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ • Where meta-analysis is not possible, data will be presented and quality assessed individually per outcome. • WinBUGS will be used for network meta-analysis, if possible given the data identified. The synthesis of qualitative data will follow a thematic analysis approach. Information will be

		synthesised into main review findings. Results will be presented in a detailed narrative and in table format with summary statements of main review findings. GRADE CERQual will be used to synthesise the qualitative data and assess the certainty of evidence for each review finding. The mixed methods synthesis will combine the themes found in the qualitative review with the effectiveness data from quantitative studies. Where possible, the studies will be matched and presented in a matrix.
17.	Analysis of sub-groups	Subgroups that will be investigated if heterogeneity is present: Community-based vs. hospital-based • Hospital-based rehabilitation • Community-based rehabilitation as part of an early supported discharge intervention • Community-based rehabilitation (not part of an early supported discharge intervention) Time after stroke at the start of the trial • Hyperacute <72 hours • Acute 72 hours – 7 days • Subacute 7 days – 6 months • Chronic >6 months Severity (as stated by category or as measured by NIHSS scale): • Mild (or NIHSS 1-5) • Moderate (or NIHSS 5-14) • Severe (or NIHSS 15-24) • Very severe (or NIHSS >25) Focus of care: • Upper limb • Lower limb • Swallow • Cognition • Communication • Mood • Pain • Fatigue • Functional independency (Return to work, return to driving ect.) • Mixed (including multidisciplinary packages of care)

		For people with communication difficulties, type of communication difficulty: • Aphasia • Dysarthria • Cognitive Communication • Apraxia of speech • Mixed Duration of therapy • ≤6 months • >6 months Computer-based tool • Computer-based tools only • Non-computer based approach only • Mixed Professional providing care • Nurses • Physiotherapists • Occupational Therapists • Speech and Language Therapists • Dietician • Clinical Neuropsychologist • Stroke Consultants • Rehabilitation Assistants • Multidisciplinary team • Other	
18.	Type and method of review	☐	Intervention
		☐	Diagnostic
		☐	Prognostic
		☐	Qualitative
		☐	Epidemiologic
		☐	Service Delivery
		☒	Other (please specify) Mixed methods
19.	Language	English	
20.	Country	England	
21.	Anticipated or actual start date	24/02/2021	
22.	Anticipated completion date	14/12/2022	

<table>
<tr><td>23.</td><td>Stage of review at time of this submission</td><td>Review stage</td><td>Started</td><td>Completed</td></tr>
<tr><td></td><td></td><td>Preliminary searches</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td>Piloting of the study selection process</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td>Formal screening of search results against eligibility criteria</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td>Data extraction</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td>Risk of bias (quality) assessment</td><td>☐</td><td>☐</td></tr>
<tr><td></td><td></td><td>Data analysis</td><td>☐</td><td>☐</td></tr>
<tr><td>24.</td><td>Named contact</td><td colspan="3">5a. Named contact
National Guideline Centre

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

5e Organisational affiliation of the review
National Institute for Health and Care Excellence (NICE) and National Guideline Centre</td></tr>
<tr><td>25.</td><td>Review team members</td><td colspan="3">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)</td></tr>
<tr><td>26.</td><td>Funding sources/sponsor</td><td colspan="3">This systematic review is being completed by the National Guideline Centre which receives funding from NICE.</td></tr>
<tr><td>27.</td><td>Conflicts of interest</td><td colspan="3">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</td></tr>
</table>

		person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.	
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10175	
29.	Other registration details	N/A	
30.	Reference/URL for published protocol	N/A	
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.	
32.	Keywords	Adults; Intervention; Intensity; Rehabilitation; Stroke	
33.	Details of existing review of same topic by same authors	N/A	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☒	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	N/A	
36.	Details of final publication	www.nice.org.uk	

Appendix B – Literature search strategies

B.1 Clinical search literature search strategy

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

Table 1: Database parameters, filters and limits applied

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

Medline (Ovid) search terms

1.	exp Stroke/
2.	Stroke Rehabilitation/
3.	exp Cerebral Hemorrhage/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
6.	"brain attack*".ti,ab.
7.	or/1-6
8.	letter/
9.	editorial/
10.	news/
11.	exp historical article/
12.	Anecdotes as Topic/
13.	comment/
14.	case report/
15.	(letter or comment*).ti.
16.	or/8-15
17.	randomized controlled trial/ or random*.ti,ab.
18.	16 not 17
19.	animals/ not humans/
20.	exp Animals, Laboratory/
21.	exp Animal Experimentation/
22.	exp Models, Animal/
23.	exp Rodentia/
24.	(rat or rats or mouse or mice or rodent*).ti.
25.	or/18-24
26.	7 not 25
27.	limit 26 to English language
28.	hospital units/ or exp patient care team/
29.	nutritionists/ or occupational therapists/ or physical therapists/
30.	(rehab* adj2 (hospital* or patient* or program* or therap* or assistant*)).ti,ab.
31.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week* or day*) adj3 (rehab* or intervention*)).ti,ab.
32.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week or day* or rehab*) adj3 (dietician* or nutritionist* or clinical neuropsychologist* or consultant* or nurse* or MDT or IDT)).ti,ab.
33.	((intens* or frequen* or duration or period* or time* or timing or hour* or week or day* rehab*) adj3 (multidisciplin* or multi-disciplin* or multi-profession* or multiprofession* or transprofession* or trans-profession* or care team* or caring team*)).ti,ab.
34.	((intens* or frequen* or duration or period* or time* or timing or hour* or week* or day* or rehab*) adj3 (physio or physiotherap* or physical therap* or occupational therap* or speech therap* or language therap*)).ti,ab.
35.	or/28-34
36.	27 and 35
37.	randomized controlled trial.pt.
38.	controlled clinical trial.pt.

39.	randomi#ed.ti,ab.
40.	placebo.ab.
41.	randomly.ti,ab.
42.	Clinical Trials as topic.sh.
43.	trial.ti.
44.	or/37-43
45.	Meta-Analysis/
46.	exp Meta-Analysis as Topic/
47.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
48.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
49.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
50.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
51.	(search* adj4 literature).ab.
52.	(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.
53.	cochrane.jw.
54.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
55.	or/45-54
56.	36 and (44 or 55)

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.	"hospital subdivisions and components"/ or *patient care/
29.	*physiotherapist/ or *dietician/ or *occupational therapist/
30.	(rehab* adj2 (hospital* or patient* or program* or therap* or assistant*)).ti,ab.
31.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week* or day*) adj3 (rehab* or intervention*)).ti,ab.
32.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week or day* or rehab*) adj3 (dietician* or nutritionist* or clinical neuropsychologist* or consultant* or nurse* or MDT or IDT)).ti,ab.
33.	((intens* or frequen* or duration or period* or time* or timing or hour* or week or day* rehab*) adj3 (multidisciplin* or multi-disciplin* or multi-profession* or multiprofession* or transprofession* or trans-profession* or care team* or caring team*)).ti,ab.
34.	((intens* or frequen* or duration or period* or time* or timing or hour* or week* or day* or rehab*) adj3 (physio or physiotherap* or physical therap* or occupational therap* or speech therap* or language therap*)).ti,ab.
35.	or/28-34
36.	27 and 35
37.	random*.ti,ab.
38.	factorial*.ti,ab.
39.	(crossover* or cross over*).ti,ab.
40.	((doubl* or singl*) adj blind*).ti,ab.
41.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
42.	crossover procedure/
43.	single blind procedure/
44.	randomized controlled trial/
45.	double blind procedure/
46.	or/37-45
47.	systematic review/
48.	meta-analysis/
49.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
50.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
51.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
52.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
53.	(search* adj4 literature).ab.
54.	(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.
55.	cochrane.jw.
56.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
57.	or/47-56
58.	36 and (46 or 57)

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: [Hospital Units] explode all trees
#11.	MeSH descriptor: [Patient Care Team] explode all trees
#12.	MeSH descriptor: [Nutritionists] explode all trees
#13.	MeSH descriptor: [Occupational Therapists] explode all trees
#14.	MeSH descriptor: [Physical Therapists] explode all trees
#15.	(rehab* near/2 (hospital* or patient* or program* or therap* or assistant*)):ti,ab
#16.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week* or day*) near/3 (rehab* or intervention*)):ti,ab
#17.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week or day* or rehab*) near/3 (dietician* or nutritionist* or clinical neuropsychologist* or consultant* or nurse* or MDT or IDT)):ti,ab
#18.	((intens* or frequen* or duration or period* or time* or timing or hour* or week or day* rehab*) near/3 (multidisciplin* or multi-disciplin* or multi-profession* or multiprofession* or transprofession* or trans-profession* or care team* or caring team*)):ti,ab
#19.	((intens* or frequen* or duration or period* or time* or timing or hour* or week* or day* or rehab*) near/3 (physio or physiotherap* or physical therap* or occupational therap* or speech therap* or language therap*)):ti,ab
#20.	(or #10-#19)
#21.	#9 and #20

Epistemonikos terms

1.	(title:((title:((rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:((rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*)))) OR (title:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) OR abstract:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)))))) OR abstract:((title:((rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:((rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*)))) OR (title:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) OR abstract:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)))))) AND (title:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:((title:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:((stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))))

PEDro search terms

1.	Stroke rehabilitation

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.	hospital units/ or exp patient care team/
17.	occupational therapists/ or physiotherapists/
18.	(rehab* adj2 (hospital* or patient* or program* or therap* or assistant*)).ti,ab.
19.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week* or day*) adj3 (rehab* or intervention*)).ti,ab.
20.	((intens* or frequen* or duration* or period* or time* or timing or hour* or week or day* or rehab*) adj3 (dietician* or nutritionist* or clinical neuropsychologist* or consultant* or nurse* or MDT or IDT)).ti,ab.
21.	((intens* or frequen* or duration or period* or time* or timing or hour* or week or day* rehab*) adj3 (multidisciplin* or multi-disciplin* or multi-profession* or multiprofession* or transprofession* or trans-profession* or care team* or caring team*)).ti,ab.
22.	((intens* or frequen* or duration or period* or time* or timing or hour* or week* or day* or rehab*) adj3 (physio or physiotherap* or physical therap* or occupational therap* or speech therap* or language therap*)).ti,ab.
23.	or/16-22
24.	15 and 23
25.	randomized controlled trials/
26.	randomized controlled trial.pt.
27.	controlled clinical trial.pt.
28.	placebo.ab.
29.	random*.ti,ab.
30.	trial.ti,ab.
31.	groups.ab.
32.	or/25-31
33.	Meta-Analysis/
34.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
35.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.

36.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
37.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
38.	(search* adj4 literature).ab.
39.	(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.
40.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
41.	or/33-40
42.	24 and (32 or 41)

B.2 Qualitative literature search strategy

Additional searches for patient views were run in Medline (OVID), Embase (OVID), CINAHL, Current Nursing and Allied Health Literature (EBSCO) and PsycINFO (OVID). Search filters were applied to the search where appropriate.

Table 2: Database parameters, filters and limits applied

Database	Dates searched	Search filter used
Medline (OVID)	Inception – 08 January 2023	Qualitative studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	Inception – 08 January 2023	Qualitative studies Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts) English language
PsycINFO (OVID)	Inception – 08 January 2023	Qualitative studies Exclusions (animal studies, letters, case reports) Human English language
Current Nursing and Allied Health Literature - CINAHL (EBSCO)	Inception – 08 January 2023	Qualitative studies Exclusions (Medline records) Human English Language

Medline (Ovid) search terms

1.	exp Stroke/
2.	Stroke Rehabilitation/
3.	exp Cerebral Hemorrhage/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
6.	"brain attack*".ti,ab.
7.	or/1-6
8.	letter/
9.	editorial/
10.	news/
11.	exp historical article/
12.	Anecdotes as Topic/
13.	comment/
14.	case report/
15.	(letter or comment*).ti.
16.	or/8-15
17.	randomized controlled trial/ or random*.ti,ab.
18.	16 not 17
19.	animals/ not humans/
20.	exp Animals, Laboratory/
21.	exp Animal Experimentation/
22.	exp Models, Animal/
23.	exp Rodentia/
24.	(rat or rats or mouse or mice or rodent*).ti.
25.	or/18-24
26.	7 not 25
27.	limit 26 to English language
28.	Qualitative research/ or Narration/ or exp Interviews as Topic/ or exp "Surveys and Questionnaires"/ or Health care surveys/
29.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
30.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
31.	or/28-30
32.	27 and 31
33.	"patient acceptance of health care"/ or exp patient satisfaction/ or consumer health information/ or needs assessment/
34.	Patient Education as Topic/ or exp patients/ or exp family/ or caregivers/ or patient preference/ or communication barrier/
35.	((educat* or learn* or support* or teach* or train*) adj3 (service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet*

	or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
36.	((patient* or carer* or client* or user* or consumer* or caregiver* care giver* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or next of kin or significant other* or patner* or guardian* or inpatient* or outpatient* or in patient* or out patient* or relative* or sibling* or sister* or brother* or grandparent* or grandfather* or grandmother*) adj3 (belief* or attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform* or experience or experiences or opinion* or preference* or focus group* or service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
37.	(information* adj3 (need* or requirement* or support* or seek* or access* or disseminat* or barrier* or service*)).ti,ab.
38.	or/33-37
39.	32 and 38

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.	health survey/ or exp questionnaire/ or exp interview/ or qualitative research/ or narrative/
29.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
30.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
31.	or/28-30
32.	27 and 31
33.	patient attitude/ or patient preference/ or patient satisfaction/ or consumer attitude/ or needs assessment/
34.	*patient information/ or *consumer health information/ or *family/ or *caregivers/
35.	communication barrier/ or *patient education/
36.	((educat* or learn* or support* or teach* or train*) adj3 (service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
37.	((patient* or carer* or client* or user* or consumer* or caregiver* care giver* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or next of kin or significant other* or patner* or guardian* or inpatient* or outpatient* or in patient* or out patient* or relative* or sibling* or sister* or brother* or grandparent* or grandfather* or grandmother*) adj3 (belief* or attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform* or experience or experiences or opinion* or preference* or focus group* or service* or information* or material* or virtual*or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
38.	(information* adj3 (need* or requirement* or support* or seek* or access* or disseminat* or barrier* or service*)).ti,ab.
39.	or/33-38
40.	32 and 39

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.	qualitative methods/ or exp interviews/ or exp questionnaires/
20.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*).ti,ab.
21.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*).ti,ab.
22.	or/18-21
23.	18 and 22
24.	exp Caregivers/ or Client Satisfaction/ or Health Information/ or exp Needs Assessment/ or Client Attitudes/ or Client Education/ or communication barriers/
25.	((educat* or learn* or support* or teach* or train*) adj3 (service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
26.	((patient* or carer* or client* or user* or consumer* or caregiver* care giver* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or next of kin or significant other* or patner* or guardian* or inpatient* or outpatient* or in patient* or out patient* or relative* or sibling* or sister* or brother* or grandparent* or grandfather* or grandmother*) adj3 (belief* or attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform* or experience or experiences or opinion* or preference* or focus group* or service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster? or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)).ti,ab.
27.	or/24-26
28.	23 and 27

CINAHL search terms

S1.	MH Stroke
S2.	MH Stroke rehabilitation
S3.	MH Cerebral Hemorrhage
S4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident") AND (rehab*)
S5.	((cerebro* or brain or brainstem or cerebral*) n3 (infarct* or accident*))
S6.	"brain attack*"
S7.	S1 OR S2 OR S3 OR S4 OR S5 OR S6
S8.	(MH "Qualitative Studies+")
S9.	(MH "Qualitative Validity+")
S10.	(MH "Interviews+") OR (MH "Focus Groups") OR (MH "Surveys") OR (MH "Questionnaires+")
S11.	(qualitative or interview* or focus group* or theme* or questionnaire* or survey*)
S12.	(metasynthes* or meta-synthes* or metasummar* or meta-summar* or metastud* or meta-stud* or metathem* or meta-them* or ethno* or emic or etic or phenomenolog* or grounded theory or constant compar* or (thematic* adj3 analys*) or theoretical sampl* or purposive sampl* or hermeneutic* or heidegger* or husserl* or colaizzi* or van kaam* or van manen* or giorgi* or glaser* or strauss* or ricoeur* or spiegelberg* or merleau*)
S13.	S8 OR S9 OR S10 OR S11 OR S12
S14.	S7 AND S13
S15.	(client* or patient* or user* or carer* or consumer* or customer* or parent* or famil* or spouse*) AND (attitud* or priorit* or perception* or preferen* or expectation* or choice* or perspective* or view* or satisfact* or inform* or experience or experiences or opinion* or preference* or focus group*)
S16.	(educat* or learn* or support*) AND (service* or information* or material* or virtual* or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster* or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)
S17.	(patient* or carer* or caregiver* or famil* or parent* or father* or mother* or spouse* or wife or wives or husband* or next of kin or significant other* or partner* or guardian* or inpatient* or outpatient* or in patient* or out patient*) AND (service* or information* or material* or virtual*or app or apps or blog* or booklet* or brochure* or dvd* or elearn* or e-learn* or email* or e-mail* or e mail* or facebook or facetime or face time or forum* or handout* or hand-out* or hand out* or helpline* or hotline* or internet* or ipad* or iphone* or leaflet* or online or magazine* or mobile phone* or newsletter* or pamphlet* or palm pilot* or personal digital assistant* or pocket pc* or podcast* or poster* or skype* or smartphone* or smart phone* or social media or social network* or sms or text messag* or twitter or tweet* or video* or web* or wiki* or youtube* or manual* or publication* or literature or computer* or interactive or telephone* or phone*)
S18.	S15 OR S16 OR S17
S19.	S14 AND S18

B.3 Health Economics literature search strategy

Health economic evidence was identified by conducting searches using terms for a broad Stroke Rehabilitation population. The following databases were searched: NHS Economic

Evaluation Database (NHS EED - this ceased to be updated after 31st March 2015), Health Technology Assessment database (HTA - this ceased to be updated from 31st March 2018) and The International Network of Agencies for Health Technology Assessment (INAHTA). Searches for recent evidence were run on Medline and Embase from 2014 onwards for health economics, and all years for quality-of-life studies. Additional searches were run in CINAHL and PsycInfo looking for health economic evidence.

Table 2: Database parameters, filters and limits applied

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

Database	Dates searched	Search filters and limits applied
		Exclusions (Medline records, animal studies, letters, editorials, comments, theses) Human English language

Medline (Ovid) search terms

1.	exp Stroke/
2.	exp Cerebral Hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	or/1-5
7.	letter/
8.	editorial/
9.	news/
10.	exp historical article/
11.	Anecdotes as Topic/
12.	comment/
13.	case report/
14.	(letter or comment*).ti.
15.	or/7-14
16.	randomized controlled trial/ or random*.ti,ab.
17.	15 not 16
18.	animals/ not humans/
19.	exp Animals, Laboratory/
20.	exp Animal Experimentation/
21.	exp Models, Animal/
22.	exp Rodentia/
23.	(rat or rats or mouse or mice or rodent*).ti.
24.	or/17-23
25.	6 not 24
26.	Economics/
27.	Value of life/
28.	exp "Costs and Cost Analysis"/
29.	exp Economics, Hospital/
30.	exp Economics, Medical/
31.	Economics, Nursing/

32.	Economics, Pharmaceutical/
33.	exp "Fees and Charges"/
34.	exp Budgets/
35.	budget*.ti,ab.
36.	cost*.ti.
37.	(economic* or pharmaco?economic*).ti.
38.	(price* or pricing*).ti,ab.
39.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
40.	(financ* or fee or fees).ti,ab.
41.	(value adj2 (money or monetary)).ti,ab.
42.	or/26-41
43.	quality-adjusted life years/
44.	sickness impact profile/
45.	(quality adj2 (wellbeing or well being)).ti,ab.
46.	sickness impact profile.ti,ab.
47.	disability adjusted life.ti,ab.
48.	(qal* or qtime* or qwb* or daly*).ti,ab.
49.	(euroqol* or eq5d* or eq 5*).ti,ab.
50.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
51.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
52.	(hui or hui1 or hui2 or hui3).ti,ab.
53.	(health* year* equivalent* or hye or hyes).ti,ab.
54.	discrete choice*.ti,ab.
55.	rosser.ti,ab.
56.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
57.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
58.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
59.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
60.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
61.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
62.	or/43-61
63.	25 and 42
64.	25 and 62
65.	limit 63 to English language
66.	limit 64 to English language

Embase (Ovid) search terms

1.	exp Cerebrovascular accident/
2.	exp Brain infarction/

3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	Intracerebral hemorrhage/
7.	or/1-6
8.	letter.pt. or letter/
9.	note.pt.
10.	editorial.pt.
11.	case report/ or case study/
12.	(letter or comment*).ti.
13.	or/8-12
14.	randomized controlled trial/ or random*.ti,ab.
15.	13 not 14
16.	animal/ not human/
17.	nonhuman/
18.	exp Animal Experiment/
19.	exp Experimental Animal/
20.	animal model/
21.	exp Rodent/
22.	(rat or rats or mouse or mice).ti.
23.	or/15-22
24.	7 not 23
25.	health economics/
26.	exp economic evaluation/
27.	exp health care cost/
28.	exp fee/
29.	budget/
30.	funding/
31.	budget*.ti,ab.
32.	cost*.ti.
33.	(economic* or pharmaco?economic*).ti.
34.	(price* or pricing*).ti,ab.
35.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
36.	(financ* or fee or fees).ti,ab.
37.	(value adj2 (money or monetary)).ti,ab.
38.	or/25-37
39.	quality adjusted life year/
40.	"quality of life index"/
41.	short form 12/ or short form 20/ or short form 36/ or short form 8/
42.	sickness impact profile/

43.	(quality adj2 (wellbeing or well being)).ti,ab.
44.	sickness impact profile.ti,ab.
45.	disability adjusted life.ti,ab.
46.	(qal* or qtime* or qwb* or daly*).ti,ab.
47.	(euroqol* or eq5d* or eq 5*).ti,ab.
48.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
49.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
50.	(hui or hui1 or hui2 or hui3).ti,ab.
51.	(health* year* equivalent* or hye or hyes).ti,ab.
52.	discrete choice*.ti,ab.
53.	rosser.ti,ab.
54.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
55.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
56.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
57.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
58.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
59.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
60.	or/39-59
61.	limit 24 to English language
62.	38 and 61
63.	60 and 61

NHS EED and HTA (CRD) search terms

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

INAHTA search terms

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

CINAHL search terms

1.	MH "Economics+"
2.	MH "Financial Management+"
3.	MH "Financial Support+"
4.	MH "Financing, Organized+"
5.	MH "Business+"
6.	S2 OR S3 or S4 OR S5
7.	S1 not S6
8.	MH "Health Resource Allocation"
9.	MH "Health Resource Utilization"

10.	S8 OR S9
11.	S7 OR S10
12.	(cost or costs or economic* or pharmacoeconomic* or price* or pricing*) OR AB (cost or costs or economic* or pharmacoeconomic* or price* or pricing*)
13.	S11 OR S12
14.	PT editorial
15.	PT letter
16.	PT commentary
17.	S14 or S15 or S16
18.	S13 NOT S17
19.	MH "Animal Studies"
20.	(ZT "doctoral dissertation") or (ZT "masters thesis")
21.	S18 NOT (S19 OR S20)
22.	PY 2014-
23.	S21 AND S22
24.	MW Stroke or MH Cerebral Hemorrhage
25.	stroke* or cva or poststroke* or apoplexy or "cerebrovascular accident"
26.	(cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)
27.	"brain attack*"
28.	S24 OR S25 OR S26 OR S27
29.	S23 AND S28

PsycINFO search terms

1.	exp Stroke/
2.	exp Cerebral hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab.
5.	"brain attack*".ti,ab.
6.	Cerebrovascular accidents/
7.	exp Brain damage/
8.	(brain adj2 injur*).ti.
9.	or/1-8
10.	Letter/
11.	Case report/
12.	exp Rodents/
13.	or/10-12
14.	9 not 13
15.	limit 14 to (human and english language)
16.	First posting.ps.
17.	15 and 16
18.	15 or 17
19	"costs and cost analysis"/

20.	"Cost Containment"/
21.	(economic adj2 evaluation$).ti,ab.
22.	(economic adj2 analy$).ti,ab.
23.	(economic adj2 (study or studies)).ti,ab.
24.	(cost adj2 evaluation$).ti,ab.
25.	(cost adj2 analy$).ti,ab.
26.	(cost adj2 (study or studies)).ti,ab.
27.	(cost adj2 effective$).ti,ab.
28.	(cost adj2 benefit$).ti,ab.
29.	(cost adj2 utili$).ti,ab.
30.	(cost adj2 minimi$).ti,ab.
31.	(cost adj2 consequence$).ti,ab.
32.	(cost adj2 comparison$).ti,ab.
33.	(cost adj2 identificat$).ti,ab.
34.	(pharmacoeconomic$ or pharmaco-economic$).ti,ab.
35.	or/19-34
36.	(0003-4819 or 0003-9926 or 0959-8146 or 0098-7484 or 0140-6736 or 0028-4793 or 1469-493X).is.
37.	35 not 36
38.	18 and 37

Appendix C – Quantitative and qualitative evidence study selection

Figure 1: Flow chart of quantitative clinical study selection for the review of intensity of rehabilitation

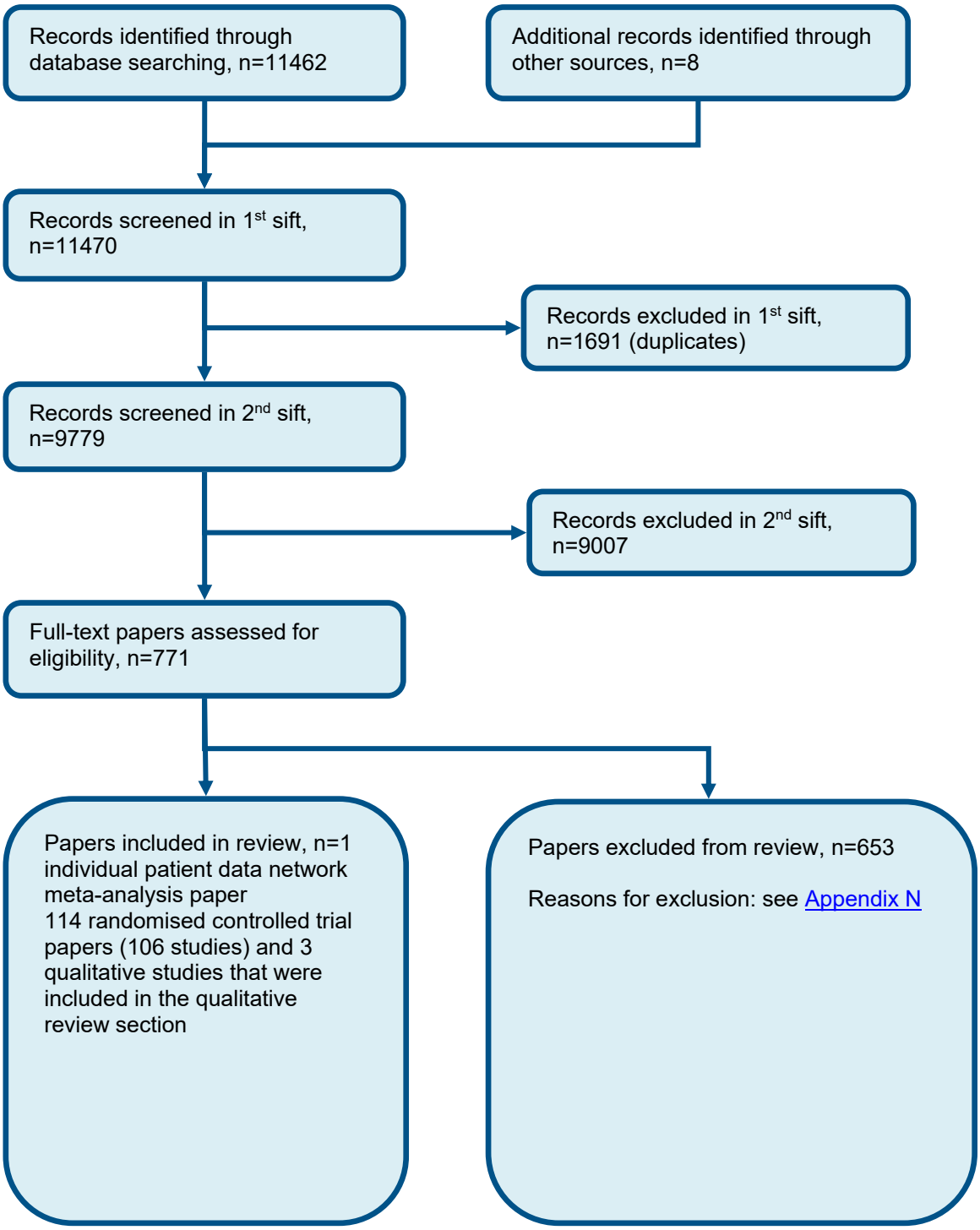
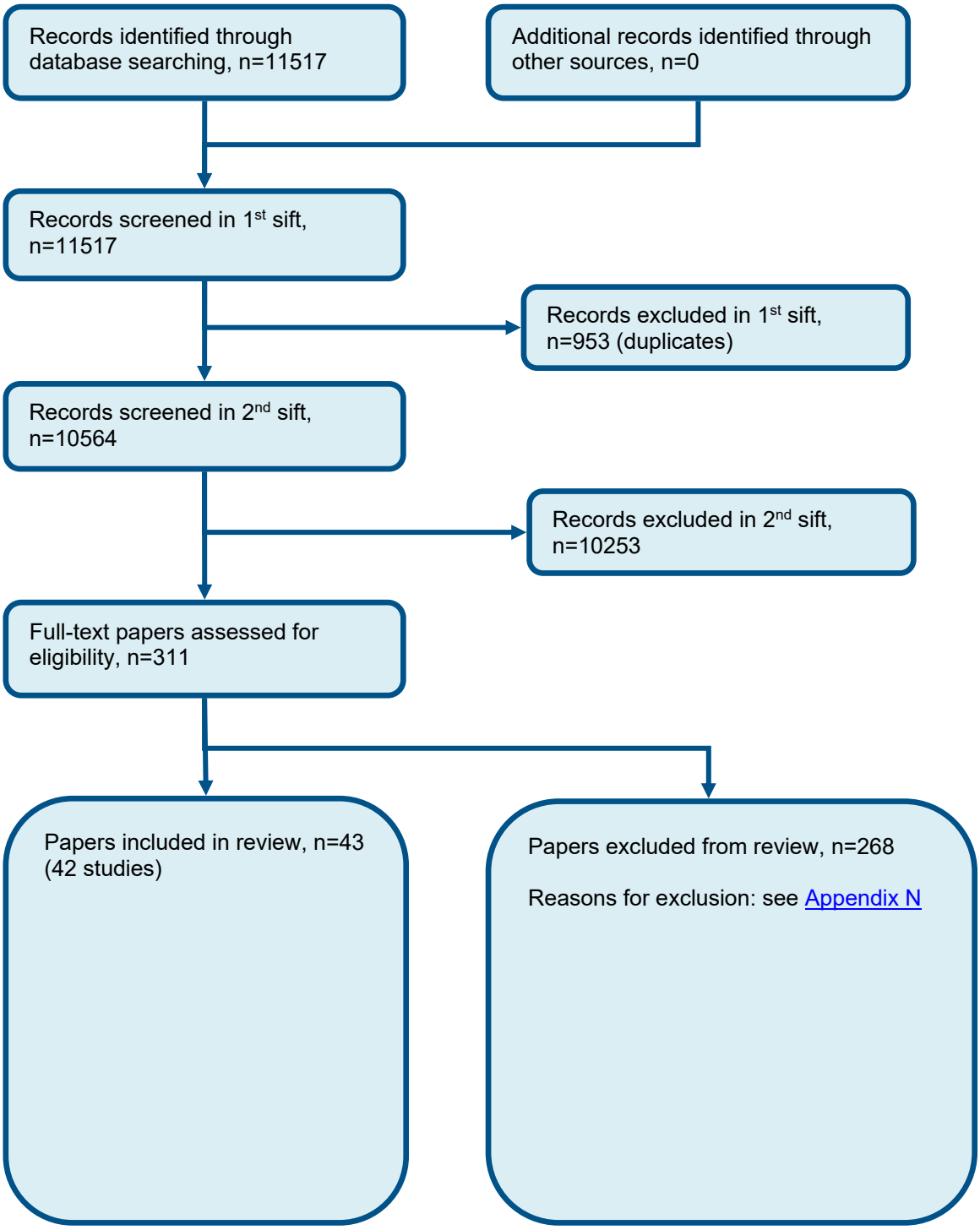


Figure 2: Flow chart of qualitative clinical study selection for the review of intensity of rehabilitation



Appendix D – Quantitative evidence

Allison, 2007

Bibliographic Reference	Allison, R.; Dennett, R.; Pilot randomized controlled trial to assess the impact of additional supported standing practice on functional ability post stroke; Clinical Rehabilitation; 2007; vol. 21 (no. 7); 614-9

Study details

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

Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Patients assessed from the Stroke Rehabilitation Unit at Newton Abbot Hospital who had a confirmed diagnosis of recent stroke.
Exclusion criteria	People who were terminally ill; suffering from an unstable comorbidity; who were unable to participate safely (physically or mentally) in additional sessions of standing.
Recruitment / selection of participants	Consecutively admitted patients at the stroke rehabilitation unit
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days per week N=17 Additional 45 minutes standing practice on each working day provided by physiotherapy assistants and typically involving the use of either standing frames, tilt tables or standing at tables to provide support while enabling standing to occur. People progressed to standing by a table for support or free standing during rehabilitation as able and were encouraged to be active whilst standing (practicing reaching tasks, sit-to-stand movements etc.). After discharge from hospital this was continued as outpatient or community based physiotherapy, but at a reduced intensity (one or two sessions per week). Concomitant therapy: Conventional physiotherapy from one or three physiotherapists working on the ward. Typically a session of 45 minutes treatment on each working day, including work on strengthening, improving movement, mobility and upper limb function.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Other Physiotherapists and rehabilitation assistants

Comparator	Physiotherapy - </= 45 minutes, 5 days per week N=10 Conventional physiotherapy only. After discharge from hospital this was continued as outpatient or community based physiotherapy, but at a reduced intensity (one or two sessions per week). Concomitant therapy: Conventional physiotherapy from one or three physiotherapists working on the ward. Typically a session of 45 minutes treatment on each working day, including work on strengthening, improving movement, mobility and upper limb function.
Number of participants	27
Duration of follow-up	12 weeks (after admission)
Indirectness	No additional information.
Elements of the study relating to qualitative themes	
Additional comments	Person centred care: Intensity tailored to the individual - Practice was adapted to be person centred (for example: free standing if the person was able to, active tasks while standing being an option). Person factors: Fatigue - Fatigue was the reason why people in the intense group discontinued from the intervention

	Intervention factor: Individual therapy Environmental factors: Hospital care

Study arms

Physiotherapy - >1 to 2 hours, 5 days per week (N = 17)
Additional 45 minutes standing practice on each working day provided by physiotherapy assistants and typically involving the use of either standing frames, tilt tables or standing at tables to provide support while enabling standing to occur. People progressed to standing by a table for support or free standing during rehabilitation as able and were encouraged to be active whilst standing (practicing reaching tasks, sit-to-stand movements etc.) Concomitant therapy: Conventional physiotherapy from one or three physiotherapists working on the ward. Typically a session of 45 minutes treatment on each working day, including work on strengthening, improving movement, mobility and upper limb function.

Physiotherapy - </= 45 minutes, 5 days per week (N = 10)
Conventional physiotherapy only. Concomitant therapy: Conventional physiotherapy from one or three physiotherapists working on the ward. Typically a session of 45 minutes treatment on each working day, including work on strengthening, improving movement, mobility and upper limb function.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days per week (N = 17)	Physiotherapy - </= 45 minutes, 5 days per week (N = 10)
% Female Sample size	n = NR ; % = NR	n = NR ; % = NR
Mean age (SD) (years) Mean (SD)	72.4 (17.9)	78 (7.9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	15.1 (16)	20.6 (20.5)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days per week compared to Physiotherapy - </= 45 minutes, 5 days per week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days per week, Baseline, N = 17	Physiotherapy - >1 to 2 hours, 5 days per week, 12 week, N = 17	Physiotherapy - </= 45 minutes, 5 days per week, Baseline, N = 10	Physiotherapy - </= 45 minutes, 5 days per week, 12 week, N = 10
Discontinuation Intervention: Fatigue = 3 No of events	n = NA ; % = NA	n = 3 ; % = 17.6	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysperweekcomparedtoPhysiotherapy-</=45minutes,5daysperweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days per week-Physiotherapy - </= 45 minutes, 5 days per week-t12

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

Askim, 2010

Bibliographic Reference	Askim, T.; Morkved, S.; Engen, A.; Roos, K.; Aas, T.; Indredavik, B.; Effects of a community-based intensive motor training program combined with early supported discharge after treatment in a comprehensive stroke unit: a randomized, controlled trial; Stroke; 2010; vol. 41 (no. 8); 1697-703

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	NCT00184431.
Study type	Randomised controlled trial (RCT)
Study location	Norway
Study setting	A stroke unit at St. Olavs Hospital, Trondheim, Norway transition to early supported discharge with care in a person's home, outpatient clinic or rehabilitation service dependent on the discharge destination.

Study dates	No additional information.
Sources of funding	Torunn Askim was supported through The Norwegian Fund for Postgraduate Training in Physiotherapy and from Clincal Service, St. Olavs Hospital, Trondheim University Hospital.
Inclusion criteria	Diagnosis of acute stroke according to WHO's definition; modified Rankin Scale score <3 before admission; Berg Balance Scale score <45 points; Scandinavian Stroke Scale score >14 points, Scandinavian Stroke Scale leg item <6 points or Scandinavian Stroke Scale transfer item <12 points; Mini-Mental State Examination score >20 points; able and willing to sign informed consent.
Exclusion criteria	Could not tolerate the increased amount of motor training because of serious cardiovascular diseases, defined as incompensated heart failure with dyspnoea or angina pectoris with chest pain during rest; other functional impairments, such as severe rheumatoid arthritis or Parkinson disease.
Recruitment / selection of participants	People admitted to the stroke unit.
Intervention(s)	Physiotherapy - >1 to 2 hours, 6 days a week N=30 Intense motor training. 3 additional session of motor training each week for the first 4 weeks after discharge from the stroke unit, and 1 additional session every week for the next 8 weeks. Each session was intended to last from 30 to 50 minutes. The patients were also encouraged to perform home exercises during this period. The additional motor training comprised reaching tasks in sitting and standing positions, sit-to-stand, step tasks, and walking tasks. All tasks were individually adapted and varied according to base of support, speed, weight and complexity. The patients were instructed to repeat as many repetitions as tolerated. The patients also partially wore an orthosis on the less affected leg during these sessions to force the use of the more affected leg. This was provided by physical therapists in the primary health care system and was added to the standard care also provided by the same therapists. It was administered in the patients' home, at a rehabilitation clinic or at an outpatient clinic, dependent on where the person was discharge after their hospital stay. The home exercises consisted of 4 tasks, with 10 repetitions of each tasks twice a day, 6 days per week. Concomitant therapy: Standard care (see comparator).

Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation as part of an early supported discharge intervention
Subgroup 2: Time after stroke at the start of the trial	Hyperacute (<72 hours)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed Upper limb and lower limb, general physical function, functional independence
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=32 Standard therapy. Treated in a comprehensive stroke unit emphasizing mobilization to standing or sitting position out of bed within the first 24 hours after onset of symptoms and physical therapy according to a task-oriented approach, focusing on independence in activities of daily living. The therapy was administered as 2 daily sessions of 30 minutes, 5 days per week. In addition, specially trained nurses in the stroke unit offered training in activities of daily living when appropriate during 24 hours. All people received early supported discharge, coordinated by a hospital-based multidisciplinary team. Additional rehabilitation was offered as inpatient rehabilitation, outpatient rehabilitation or as rehabilitation in the patients' home according to the patients' needs. Concomitant therapy: Standard care.
Number of participants	62
Duration of follow-up	26 weeks in total (follow up at 4 weeks, 12 weeks after discharge, and 26 weeks after stroke)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - People were asked to do as many repetitions as they could tolerate. All tasks were individually adapted and varied according to base of support, speed, weight and complexity.

	Intervention factors: Individual therapy 'Home work'/self management interventions Travel time - Reduced travel time (care at home or outpatient setting) Environmental factors: Home Accessible therapy - Home based (or outpatient setting)
Additional comments	Intention-to-treat analysis (any missing values were imputed using last-value-observed carried forward).

Study arms

Physiotherapy - >1 to 2 hours, 6 days a week (N = 30)
Intense motor training. 3 additional session of motor training each week for the first 4 weeks after discharge from the stroke unit, and 1 additional session every week for the next 8 weeks. Each session was intended to last from 30 to 50 minutes. The patients were also encouraged to perform home exercises during this period. The additional motor training comprised reaching tasks in sitting and

standing positions, sit-to-stand, step tasks, and walking tasks. All tasks were individually adapted and varied according to base of support, speed, weight and complexity. The patients were instructed to repeat as many repetitions as tolerated. The patients also partially wore an orthosis on the less affected leg during these sessions to force the use of the more affected leg. This was provided by physical therapists in the primary health care system and was added to the standard care also provided by the same therapists. It was administered in the patients' home, at a rehabilitation clinic or at an outpatient clinic, dependent on where the person was discharge after their hospital stay. The home exercises consisted of 4 tasks, with 10 repetitions of each tasks twice a day, 6 days per week. Concomitant therapy: Standard care (see comparator).

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 32)
Standard therapy. Treated in a comprehensive stroke unit emphasizing mobilization to standing or sitting position out of bed within the first 24 hours after onset of symptoms and physical therapy according to a task-oriented approach, focusing on independence in activities of daily living. The therapy was administered as 2 daily sessions of 30 minutes, 5 days per week. In addition, specially trained nurses in the stroke unit offered training in activities of daily living when appropriate during 24 hours. All people received early supported discharge, coordinated by a hospital-based multidisciplinary team. Additional rehabilitation was offered as inpatient rehabilitation, outpatient rehabilitation or as rehabilitation in the patients' home according to the patients' needs. Concomitant therapy: Standard care.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, 6 days a week (N = 30)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 32)**
% Female Sample size	n = 19 ; % = 59.4	n = 14 ; % = 44.8
Mean age (SD) (years) Mean (SD)	75.4 (7.9)	77.6 (9.6)

Characteristic	Physiotherapy - >1 to 2 hours, 6 days a week (N = 30)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 32)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Myocardial infarction Sample size	n = 8 ; % = 26.1	n = 1 ; % = 3.1
Atrial fibrillation Sample size	n = 4 ; % = 13.3	n = 8 ; % = 25
Hypertension Sample size	n = 21 ; % = 70	n = 25 ; % = 78.1
Diabetes Sample size	n = 0 ; % = 0	n = 7 ; % = 21.9
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Type of communication difficulty	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 to 2 hours, 6 days a week (N = 30)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 32)
Sample size		

Outcomes

Study timepoints

- Baseline
- 26 week (≥ 6 months)

Physiotherapy - >1 to 2 hours, 6 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 6 days a week, Baseline, N = 30	Physiotherapy - >1 to 2 hours, 6 days a week, 26 week, N = 30	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 32	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 32
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	72.7 (20)	92.5 (9.7)	70.8 (16.2)	91.4 (16.9)
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	26.6 (12.6)	46.9 (10.6)	23.7 (11.1)	45.1 (11.6)

Outcome	Physiotherapy - >1 to 2 hours, 6 days a week, Baseline, N = 30	Physiotherapy - >1 to 2 hours, 6 days a week, 26 week, N = 30	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 32	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 32
Person/participant generic health-related quality of life (Stroke Impact Scale) Scale range: 0-100. Final values. Mean (SD)	NA (NA)	NA (NA)	NA (NA)	NA (NA)
Stroke Impact Scale, mobility Mean (SD)	58.8 (22.3)	81 (18.1)	58.7 (27.2)	79.5 (21.1)
Stroke Impact Scale, recovery Mean (SD)	43.7 (19.5)	66 (17.1)	47.3 (20.4)	63.1 (21.1)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better
Person/participant generic health-related quality of life (Stroke Impact Scale) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 6 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - dichotomous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 6 days a week, Baseline, N = 30	Physiotherapy - >1 to 2 hours, 6 days a week, 26 week, N = 30	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 32	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 32
Discontinuation Intervention: 1 died, 1 serious illness because of bilateral leg amputation	n = NA ; % = NA	n = 2 ; % = 6.7	n = NA ; % = NA	n = 0 ; % = 0

Outcome	Physiotherapy - >1 to 2 hours, 6 days a week, Baseline, N = 30	Physiotherapy - >1 to 2 hours, 6 days a week, 26 week, N = 30	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 32	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 32
No of events				

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >1 to 2 hours, 6 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t26

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

Physiotherapy->1to2hours,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 to 2 hours, 6 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t26

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

Physiotherapy->1to2hours,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScale)-StrokeImpactScale,mobility-MeanSD-Physiotherapy - >1 to 2 hours, 6 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t26

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

Physiotherapy->1to2hours,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScale)-StrokeImpactScale,recovery-MeanSD-Physiotherapy - >1 to 2 hours, 6 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t26

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

Physiotherapy->1to2hours,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 6 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t26

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

Askim, 2018

Bibliographic Reference	Askim, Torunn; Langhammer, Birgitta; Ihle-Hansen, Hege; Gunnes, Mari; Lydersen, Stian; Indredavik, Bent; Efficacy and Safety of Individualized Coaching After Stroke: the LAST Study (Life After Stroke); A pragmatic randomized controlled trial; 2018; vol. 49 (no. 2); 426-432

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	NCT01467206
Study type	Randomised controlled trial (RCT)
Study location	Norway
Study setting	Performed at 2 centers in Norway: Trondheim University Hospital and Baerum Hospital, in close collaborate with the primary healthcare service in the municipalities of Trondheim, Asker and Baerum.

Study dates	October 18th 2011 to January 15th 2016
Sources of funding	Funded by Norwegian Research Council, Liaison Committee between Central Norway Regional Health Authority and Norwegian University of Science and Technology, Joint Research Committee between St. Olavs Hospital and NTNU, Norwegian Fund for Postgraduate Training in Physiotherapy, and Stroke Unity Research Fund at St. Olavs Hospital.
Inclusion criteria	Aged at least 18 years; had confirmed first-ever or recurrent stroke (infarction or intracerebral haemorrhage); had been discharged from hospital or inpatient rehabilitation and were community dwelling with a modified Rankin Scale score <5; no serious comorbidities that made it difficult to perform the intervention; capable of providing consent.
Exclusion criteria	Serious medical comorbidity with short life expectancy; cognitive deficits as evaluated by the Mini-Mental State Examination <21 points (or <17 points for patients with aphasia); contraindication to participation in motor training; inclusion in another study.
Recruitment / selection of participants	People treated at the stroke unit at participating hospitals.
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 7 days a week N=186 People were asked to complete a standardized questionnaire to register their individual physical activity preferences and to list 1 to 3 individual goals using Goal Attainment Scaling. Based on the preferences and goals, a schedule for physical activities and exercise was set for the next month. the exercise needed to last 45 to 60 minutes and include 2 to 3 periods of vigorous activity once a week while the physical activity needed to last 30 minutes 7 days a week. Vigorous activity was defined as a rating of 15 to 17 on the Borg scale of perceived exertion. To comply with the weekly exercise, participants were offered participation in several existing outpatient, private and community-based treatment groups, individual physiotherapy, or home training if preferred. The first 6 meetings were performed face-to-face in the participants' home; in the next 6 months every second meeting could take place as a phone meeting, and during the final 6 months, 4 of the 6 meetings could take place as a phone meeting. Concomitant therapy: Rehabilitation after discharge from hospital usually consists of 45 minutes of physiotherapy at moderate intensity per week performed in the patient's home, at an outpatient clinic or during inpatient rehabilitation. Rehabilitation is often limited to the first 3 months for patients with mild to moderate strokes but can last for up to 6 months

	for patients with the most severe strokes and for selected patients even longer. After the end of rehabilitation, patients and their families have to take responsibility for further physical activity and exercise.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mixed Majority <8, with a small number 8-16.
Subgroup 4: Focus of care	Mixed Physical function/activities of daily living
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Greater than 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </= 45 minutes, <5 days a week N=194 Standard therapy only. Concomitant therapy: Rehabilitation after discharge from hospital usually consists of 45 minutes of physiotherapy at moderate intensity per week performed in the patient's home, at an outpatient clinic or during inpatient rehabilitation. Rehabilitation is often limited to the first 3 months for patients with mild to moderate strokes but can last for up to 6 months for patients with the most severe strokes and for selected patients even longer. After the end of rehabilitation, patients and their families have to take responsibility for further physical activity and exercise.
Number of participants	380
Duration of follow-up	18 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - Person centred choice of activities and goals. Support from family and friends

	Continuity of care - at the end of intervention family members and the stroke survivor would take on the responsibility of doing the exercises Intervention factors: Individual therapy 'Homework'/self management interventions Longer term rehabilitation Seven day working Variety in activities and choice Goal setting Environmental factors: Home Service factors: Seven day working

Additional comments	Intention to treat analysis approach

Study arms

Physiotherapy - >45 minutes to 1 hour, 7 days a week (N = 186)
People were asked to complete a standardized questionnaire to register their individual physical activity preferences and to list 1 to 3 individual goals using Goal Attainment Scaling. Based on the preferences and goals, a schedule for physical activities and exercise was set for the next month. the exercise needed to last 45 to 60 minutes and include 2 to 3 periods of vigorous activity once a week while the physical activity needed to last 30 minutes 7 days a week. Vigorous activity was defined as a rating of 15 to 17 on the Borg scale of perceived exertion. To comply with the weekly exercise, participants were offered participation in several existing outpatient, private and community-based treatment groups, individual physiotherapy, or home training if preferred. The first 6 meetings were performed face-to-face in the participants' home; in the next 6 months every second meeting could take place as a phone meeting, and during the final 6 months, 4 of the 6 meetings could take place as a phone meeting. Concomitant therapy: Rehabilitation after discharge from hospital usually consists of 45 minutes of physiotherapy at moderate intensity per week performed in the patient's home, at an outpatient clinic or during inpatient rehabilitation. Rehabilitation is often limited to the first 3 months for patients with mild to moderate strokes but can last for up to 6 months for patients with the most severe strokes and for selected patients even longer. After the end of rehabilitation, patients and their families have to take responsibility for further physical activity and exercise.

Physiotherapy - </= 45 minutes, <5 days a week (N = 194)
Standard therapy only. Concomitant therapy: Rehabilitation after discharge from hospital usually consists of 45 minutes of physiotherapy at moderate intensity per week performed in the patient's home, at an outpatient clinic or during inpatient rehabilitation. Rehabilitation is often limited to the first 3 months for patients with mild to moderate strokes but can last for up to 6 months for patients with the most severe strokes and for selected patients even longer. After the end of rehabilitation, patients and their families have to take responsibility for further physical activity and exercise.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 7 days a week (N = 186)	Physiotherapy - </= 45 minutes, <5 days a week (N = 194)
% Female Sample size	n = 82 ; % = 44.1	n = 67 ; % = 34.5
Mean age (SD) (years) Sample size	n = NA ; % = NA	n = NA ; % = NA
At least 80 Sample size	n = 44 ; % = 23.7	n = 53 ; % = 27.3
Less than 80 Sample size	n = 142 ; % = 76.3	n = 141 ; % = 72.7
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
NIHSS <8 Sample size	n = 181 ; % = 97.3	n = 188 ; % = 96.9

Characteristic	Physiotherapy - >45 minutes to 1 hour, 7 days a week (N = 186)	Physiotherapy - </= 45 minutes, <5 days a week (N = 194)
NIHSS 8-16 Sample size	n = 5 ; % = 2.7	n = 6 ; % = 3.1
NIHSS >16 Sample size	n = 0 ; % = 0	n = 0 ; % = 0
Time period since stroke (days) Mean (SD)	111.3 (24.5)	112 (17.2)
Type of communication difficulty Sample size	n = NA ; % = NA	n = NA ; % = NA

Outcomes

Study timepoints

- Baseline
- 18 month (≥6 months)

Physiotherapy - >45 minutes to 1 hour, 7 days a week compared to Physiotherapy - </= 45 minutes, <5 days a week at ≥6 months - continuous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, 7 days a week, Baseline, N = 186	Physiotherapy - >45 minutes to 1 hour, 7 days a week, 18 month, N = 186	Physiotherapy - </= 45 minutes, <5 days a week, Baseline, N = 194	Physiotherapy - </= 45 minutes, <5 days a week, 18 month, N = 194
Person/participant generic health related quality of life (Stroke Impact Scale) Scale range: 0-100. Final values. Mean (SE)	NR (NR)	72.8 (2.67)	NR (NR)	73.5 (2.58)
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SE)	96.4 (0.05)	90.2 (0.18)	96.1 (0.066)	90.2 (0.16)
Stroke outcome - modified Rankin scale Scale range: 0-6. Final values. Mean (SE)	1.45 (0.056)	1.28 (0.12)	1.44 (0.079)	1.33 (0.11)
Physical function - lower limb (Berg Balance Scale, item 14) Scale range: 0-4. Final values. Mean (SE)	2.55 (0.11)	2.63 (0.12)	2.52 (0.1)	2.71 (0.1)

Person/participant generic health related quality of life (Stroke Impact Scale) - Polarity - Higher values are better
Activities of daily living (barthel index) - Polarity - Higher values are better
Stroke outcome - modified Rankin scale - Polarity - Lower values are better

Physical function - lower limb (Berg Balance Scale, item 14) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 7 days a week compared to Physiotherapy - </= 45 minutes, <5 days a week at ≥6 months - dichotomous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, 7 days a week, Baseline, N = 186	Physiotherapy - >45 minutes to 1 hour, 7 days a week, 18 month, N = 186	Physiotherapy - </= 45 minutes, <5 days a week, Baseline, N = 194	Physiotherapy - </= 45 minutes, <5 days a week, 18 month, N = 194
Discontinuation Intervention: 9 died, 17 withdrew, 6 serious illness, 10 other reasons/unknown. Control: 9 died during follow up. No of events	n = NA ; % = NA	n = 42 ; % = 22.6	n = NA ; % = NA	n = 9 ; % = 4.6

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,7daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat≥6months-continuousoutcomes-Person/participantgenerichealthrelatedqualityoflife(StrokeImpactScale)-MeanSE-Physiotherapy - >45 minutes to 1 hour, 7 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t18

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

Physiotherapy->45minutesto1hour,7daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat≥6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSE-Physiotherapy - >45 minutes to 1 hour, 7 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t18

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

Physiotherapy->45minutesto1hour,7daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat≥6months-continuousoutcomes-Strokeoutcome-modifiedRankinscale-MeanSE-Physiotherapy - >45 minutes to 1 hour, 7 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t18

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

Physiotherapy->45minutesto1hour,7daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat≥6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale,item14)-MeanSE-Physiotherapy - >45 minutes to 1 hour, 7 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t18

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

Physiotherapy->45minutesto1hour,7daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat≥6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 7 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t18

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

Bakheit, 2007

Bibliographic Reference	Bakheit, A. M.; Shaw, S.; Barrett, L.; Wood, J.; Carrington, S.; Griffiths, S.; Searle, K.; Koutsi, F.; A prospective, randomized, parallel group, controlled study of the effect of intensity of speech and language therapy on early recovery from poststroke aphasia; Clinical Rehabilitation; 2007; vol. 21 (no. 10); 885-94

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	A hospital stroke unit and community
Study dates	No additional information.
Sources of funding	Supported by a research grant from the Tavistock Trust for Aphasia.
Inclusion criteria	A diagnosis of first-ever stroke. The diagnosis was made on clinical grounds and was based on the World Health Organization criteria and confirmed with a CT head scan; a score of less than 93.8 on the Western Aphasia Battery; native English language speaker (people for whom English is not the first language were excluded because of concerns about the validity and reliability of the translated versions of the Western Aphasia Battery); medically stable and able to undergo the assessments and treatment
Exclusion criteria	A diagnosis of depressive illness or Parkinson's disease. These disorders are known to reduce verbal fluency and impair language processing and may therefore interfere with the interpretation of the Western Aphasia Battery scores; if the person was moribund and unlikely to survive the acute stroke; severe dysarthria; residence in an area 15 miles or more from the hospital (excluded to reduce the time and cost of travel by the therapists to deliver treatment and to carry out the assessments following the patient's discharge from hospital).
Recruitment / selection of participants	People with a diagnosis of first ever stroke admitted to a district general hospital.
Intervention(s)	Speech and language therapy - >45 mins to 1 hour, 5 days per week N=51 5 hours of speech and language therapy per week for 12 consecutive weeks.

	Concomitant therapy: This intervention was a part of a multidisciplinary, goal-directed rehabilitation program.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Mixed Started in the hospital's rehabilitation unit and continued in the outpatients departments or in the patient's home following discharge from hospital.
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and language therapy - >45 mins to 1 hour, <5 days per week N=65 2 hours of speech and language therapy per week for 12 consecutive weeks - this was split between the standard therapy intervention group (n=46) and the NHS group (n=19), who were supposed to receive the same amount of time but generally received less than the amount of the standard therapy intervention group. Concomitant therapy: This intervention was a part of a multidisciplinary, goal-directed rehabilitation program.
Number of participants	116
Duration of follow-up	24 weeks (intervention completed at 12 weeks, follow up at 4 weeks, 8 weeks, 12 weeks and 24 weeks).
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Patient centred care: Intensity tailored to the individual - The treatment procedure was similar from patient to patient and between therapists (without compromising the need for an individualised approach to suit the patient's needs)

	People requiring specific consideration: People with communication difficulties Intervention factors: Individual therapy Environmental factors: Hospital care then home
Additional comments	Intention to treat

Study arms

Speech and language therapy - >45 mins to 1 hour, 5 days per week (N = 51)
5 hours of speech and language therapy per week for 12 consecutive weeks. Concomitant therapy: This intervention was a part of a multidisciplinary, goal-directed rehabilitation program.

Speech and language therapy - >45 mins to 1 hour, <5 days per week (N = 65)
2 hours of speech and language therapy per week for 12 consecutive weeks - this was split between the standard therapy intervention group (n=46) and the NHS group (n=19), who were supposed to receive the same amount of time but generally received less than the

amount of the standard therapy intervention group. Concomitant therapy: This intervention was a part of a multidisciplinary, goal-directed rehabilitation program.

Characteristics

Arm-level characteristics

Characteristic	Speech and language therapy - >45 mins to 1 hour, 5 days per week (N = 51)	Speech and language therapy - >45 mins to 1 hour, <5 days per week (N = 65)
% Female Sample size	n = 25 ; % = 49	n = 34 ; % = 52
Mean age (SD) (years) Mean (SD)	71.2 (14.9)	70.6 (15)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	34.2 (19.1)	28.7 (16.9)
Type of communication difficulty Sample size	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Speech and language therapy - >45 mins to 1 hour, 5 days per week (N = 51)	Speech and language therapy - >45 mins to 1 hour, <5 days per week (N = 65)
Aphasia Sample size	n = 51 ; % = 100	n = 65 ; % = 100

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)
- 24 week (≥6 months)

Speech and language therapy - >45 mins to 1 hour, 5 days per week compared to Speech and language therapy - >45 mins to 1 hour, <5 days per week at <6 months and ≥6 months - continuous outcomes

Outcome	Speech and language therapy - >45 mins to 1 hour, 5 days per week, Baseline, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 12 week, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 24 week, N = 51	Speech and language therapy - >45 mins to 1 hour, <5 days per week, Baseline, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 12 week, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 24 week, N = 65
Communication - Overall language ability (Western Aphasia Battery) Scale range: 0-100. Change scores.	44.2 (30.2)	24.8 (14.2)	27 (16.1)	40.2 (29.6)	23.1 (15.8)	26 (17.9)

Outcome	Speech and language therapy - >45 mins to 1 hour, 5 days per week, Baseline, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 12 week, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 24 week, N = 51	Speech and language therapy - >45 mins to 1 hour, <5 days per week, Baseline, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 12 week, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 24 week, N = 65
Mean (SD)						

Communication - Overall language ability (Western Aphasia Battery) - Polarity - Higher values are better

Speech and language therapy - >45 mins to 1 hour, 5 days per week compared to Speech and language therapy - >45 mins to 1 hour, <5 days per week at <6 months and ≥6 months - dichotomous outcomes

Outcome	Speech and language therapy - >45 mins to 1 hour, 5 days per week, Baseline, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 12 week, N = 51	Speech and language therapy - >45 mins to 1 hour, 5 days per week, 24 week, N = 51	Speech and language therapy - >45 mins to 1 hour, <5 days per week, Baseline, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 12 week, N = 65	Speech and language therapy - >45 mins to 1 hour, <5 days per week, 24 week, N = 65
Discontinuation 12 weeks. Intensive therapy = 13, standard therapy = 8, NHS group = 0. 24 weeks: Intensive therapy = 17. Standard therapy = 11. NHS group = 4. No of events	n = NA ; % = NA	n = 13 ; % = 25.5	n = 17 ; % = 33.3	n = NA ; % = NA	n = 8 ; % = 12.3	n = 15 ; % = 23.1

Discontinuation - Polarity - Lower values are better

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

Multidisciplinary team->45minsto1hour,5daysperweekcomparedtoMultidisciplinary team->45minsto1hour,<5daysperweekat<6monthsand≥6months-continuousoutcomes-Communication-OverallIlanguageability(WesternAphasiaBattery)-MeanSD-Multidisciplinary team - >45 mins to 1 hour, 5 days per week-Multidisciplinary team - >45 mins to 1 hour, <5 days per week-t12

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

Multidisciplinary team->45minsto1hour,5daysperweekcomparedtoMultidisciplinary team->45minsto1hour,<5daysperweekat<6monthsand≥6months-continuousoutcomes-Communication-OverallIlanguageability(WesternAphasiaBattery)-MeanSD-Multidisciplinary team - >45 mins to 1 hour, 5 days per week-Multidisciplinary team - >45 mins to 1 hour, <5 days per week-t24

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

Multidisciplinary team->45minsto1hour,5daysperweekcomparedtoMultidisciplinary team->45minsto1hour,<5daysperweekat<6monthsand≥6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Multidisciplinary team - >45 mins to 1 hour, 5 days per week-Multidisciplinary team - >45 mins to 1 hour, <5 days per week-t12

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Multidisciplinary team->45minsto1hour,5daysperweekcomparedtoMultidisciplinary team->45minsto1hour,<5daysperweekat<6monthsand≥6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Multidisciplinary team ->45 mins to 1 hour, 5 days per week-Multidisciplinary team - >45 mins to 1 hour, <5 days per week-t24

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

Barcala, 2013

Bibliographic Reference	Barcala, L.; Grecco, L. A.; Colella, F.; Lucareli, P. R.; Salgado, A. S.; Oliveira, C. S.; Visual biofeedback balance training using wii fit after stroke: a randomized controlled trial; Journal of Physical Therapy Science; 2013; vol. 25 (no. 8); 1027-32

Study details

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

Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Brazil
Study setting	A physical therapy clinic of the Universidade Nove De Julho (Brazil)
Study dates	No additional information
Sources of funding	Financial support from Conselho Nacional de Desenvolvimento Cientifico e Technologico (CNPq) and Coordenacao de Aperfeicoamento de pessoal de Nivel Superior (CAPES)
Inclusion criteria	Weekly physical therapy sessions at the institution; chronic sequelae stemming from a stroke; the ability to remain in an orthostatic position without support; absence of osteoarticular deformities; the ability to understand the visual biofeedback
Exclusion criteria	Individuals with associated diseases not pertinent to the physiopathology of stroke
Recruitment / selection of participants	People attending the physical therapy clinic
Intervention(s)	Physiotherapy - >1 hour to 2 hours, <5 days a week N=10 Conventional physical therapy and 30 minutes of balance training with visual biofeedback using the Wii Fit(R) program. This equipment consists of a platform, referred to as the Wii Balance Board(R), which has sensors that measure weight and centre of gravity. This has 40 types of balance exercises. However, for the present study, only three were selected:

	plataformas, pesca bajo cero, and la cuerda floja. The degree of difficulty was based on the interaction with the exercises, with the person going onto the next level after successfully completing the previous level. each exercise lasted 10 minutes, with a rest interval between exercises based on the physical conditioning of each patient. Concomitant therapy: Conventional physical therapy, 60 minutes, 2 sessions per week for 5 weeks. Conventional physical therapy involved stretching, joint movement, muscle strengthening, static and dynamic balance training, and the training of functional activities.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, <5 days a week N=10 Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 60 minutes, 2 sessions per week for 5 weeks. Conventional physical therapy involved stretching, joint movement, muscle strengthening, static and dynamic balance training, and the training of functional activities.
Number of participants	20
Duration of follow-up	7 weeks (end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors: Hospital care Use of expensive equipment - WiiFit software, balance board and Wii device
Additional comments	ITT (no participants withdrew)

Study arms

Physiotherapy - >1 hour to 2 hours, <5 days a week (N = 10)
Conventional physical therapy and 30 minutes of balance training with visual biofeedback using the Wii Fit(R) program. This equipment consists of a platform, referred to as the Wii Balance Board(R), which has sensors that measure weight and centre of gravity. This has 40 types of balance exercises. However, for the present study, only three were selected: plataformas, pesca bajo cero, and la cuerda floja. The degree of difficulty was based on the interaction with the exercises, with the person going onto the next level after successfully completing the previous level. each exercise lasted 10 minutes, with a rest interval between exercises based on the physical conditioning of each patient. Concomitant therapy: Conventional physical therapy, 60 minutes, 2 sessions per week for 5 weeks. Conventional physical therapy involved stretching, joint movement, muscle strengthening, static and dynamic balance training, and the training of functional activities.

Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 10)
Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 60 minutes, 2 sessions per week for 5 weeks. Conventional physical therapy involved stretching, joint movement, muscle strengthening, static and dynamic balance training, and the training of functional activities.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 hour to 2 hours, <5 days a week (N = 10)**	**Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 10)**
% Female Sample size	n = 5 ; % = 50	n = 6 ; % = 60
Mean age (SD) (years) Mean (SD)	65.2 (12.5)	63.5 (14.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	12.3 (7.1)	15.2 (6.6)

Characteristic	Physiotherapy - >1 hour to 2 hours, <5 days a week (N = 10)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 10)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

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

Physiotherapy - >1 hour to 2 hours, <5 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 10	Physiotherapy - >1 hour to 2 hours, <5 days a week, 7 week, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 7 week, N = 10
Activities of daily living (functional independence measure) Scale range: 1-7? (Unclear, but given the size likely just reporting the average of the questions). Final values. Mean (SD)	4.91 (0.96)	6.12 (0.68)	4.8 (0.63)	5.72 (0.67)

Outcome	Physiotherapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 10	Physiotherapy - >1 hour to 2 hours, <5 days a week, 7 week, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 7 week, N = 10
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	39.6 (6.43)	41.9 (6.91)	37.2 (5.22)	42.2 (4.8)

Activities of daily living (functional independence measure) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >1 hour to 2 hours, <5 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - dichotomous outcomes

Outcome	Physiotherapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 10	Physiotherapy - >1 hour to 2 hours, <5 days a week, 7 week, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 7 week, N = 10
Discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1hourto2hours,<5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Physiotherapy - >1 hour to 2 hours, <5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t7

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

Physiotherapy->1hourto2hours,<5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 hour to 2 hours, <5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t7

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

Physiotherapy->1hourto2hours,<5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >1 hour to 2 hours, <5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t7

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

Brady, 2021

Bibliographic Reference	Brady MC, Ali M, VandenBerg K, Williams LJ, Williams LR, Abo M et al. Dosage, Intensity, and Frequency of Language Therapy for Aphasia: A Systematic Review-Based, Individual Participant Data Network Meta-Analysis. Stroke. 2021; 53(3):956-967

Study Characteristics

Study design	Systematic review Individual patient data network meta analysis
Study details	Dates searched Inception to September 2015 plus trial registrations for emerging trials Databases searched Medline, Embase and checking reference lists Sources of funding This study was supported by the National Institute for Health Research Health Services and Delivery Research (14/04/22); The Tavistock Trust for Aphasia, United Kingdom.
Study and participant inclusion criteria	Randomised controlled trials with at least 10 individual patient data on aphasia severity, formal measures of functional language use, language expression, auditory comprehension, reading or writing and time since stroke (or time since aphasia onset) at the initial assessment

Study and participant exclusion criteria	No additional exclusion criteria
Intervention(s)	Speech and language therapy interventions: “any targeted practice or rehabilitation tasks that aimed to improve language or communication abilities, activities, or participation..”
Outcome(s)	Functional Language, Aphasia Severity (Severity of Language Impairment), Auditory Comprehension, Spoken Language Production, Reading, Writing. No overall requirements on the timing of measurements as various time points contributed to different planned analyses.
Number of studies included in the systematic review	25 (928 individual patient data)
Studies from the systematic review that are relevant for use in the current review	This study conducted a Network Meta Analysis with the following studies. Some studies would not be relevant for use in the current review without this having been conducted. Ciccone 2015 de Jon-Hagelstein 2011 Doesborg 2004a Doesborg 2004b Mattioli 2014 Meikle 1979 Laska 2011 Rodriguez 2013

	Woodhead 2017
	Lincoln 1980a
	Lincoln 1980b
	Szaflarski 2015
	Palmer 2012
	Smania 2006 and 2000
	Breitenstein 2017
	Godecke 2012
	Kukkonen (unpublished)
	Martins 2013
	Meinzer 2007
	Khedr 2014
	van der Meulen 2016
	Rubi-Fessen 2015
	Efstratiadou 2019
	You 2011

Additional comments	This review is a network meta analysis that uses comparisons of different dosages of speech and language therapy in order to form networks. This includes incorporating studies where no treatment is a comparison arm, which would have been excluded in this review. The study reports four different measures of intensity: total speech and language therapy hours, number of hours per week, number of days per week and duration of therapy (latter two in the supplementary material). To maintain consistency with our protocol we included the data from the number of hours per week and number of days per week comparisons, noting that the number of hours per week is different from the number of days per week stated in the protocol.

Study arms

Speech and Language Therapy - 9+ hours per week (N = NA)

Speech and Language Therapy - 4-9 hours per week (N = NA)

Speech and Language Therapy - 3-4 hours per week (N = NA)

Speech and Language Therapy - 2-3 hours per week (N = NA)

Speech and Language Therapy - Up to 2 hours per week (N = NA)

Speech and Language Therapy - 5+ days per week (N = NA)

Speech and Language Therapy - 5 days per week (N = NA)

Speech and Language Therapy - 4 days per week (N = NA)

Speech and Language Therapy - 3 days per week (N = NA)

Speech and Language Therapy - up to 2 days per week (N = NA)

Characteristics

Study-level characteristics

Characteristic	**Study (N = 959)**
Age (years) Median (IQR)	63 (54.1 to 74)
Time poststroke (days) Median (IQR)	61 (7 to 487)
Stroke type Sample size	n = NA ; % = NA
Ischaemic Sample size	n = 685 ; % = 88.9

Characteristic	Study (N = 959)
Intracerebral haemorrhage Sample size	n = 77 ; % = 10
Subarachnoid haemorrhage Sample size	n = 9 ; % = 1.2
% Female Sample size	n = 390 ; % = 42
Ethnicity Sample size	n = NA ; % = NA
Black Sample size	n = 5 ; % = 5.3
White Sample size	n = 89 ; % = 94.7

Outcomes

Study timepoints

- 0 month (Trial durations ranged from 2 weeks to 84 weeks)

Communication - Overall language ability (WAB-AQ)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 96	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 50	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 104	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 93	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 72	Speech and Language Therapy - 5+ days per week, 0 month, N = 32	Speech and Language Therapy - 5 days per week, 0 month, N = 194	Speech and Language Therapy - 4 days per week, 0 month, N = 76	Speech and Language Therapy - 3 days per week, 0 month, N = 21	Speech and Language Therapy - up to 2 days per week, 0 month, N = 90
Communication - Overall language ability (WAB-AQ) Scale range: 0-100, change scores Mean (95% CI)	15.64 (9.14 to 22.13)	12.22 (4.53 to 19.91)	15.8 (8.85 to 22.74)	10.18 (4.03 to 16.32)	15.85 (8.06 to 23.64)	14.14 (5.99 to 22.29)	14.95 (8.67 to 21.23)	13.08 (5.4 to 20.76)	13.35 (4.29 to 22.41)	10.24 (3.51 to 16.97)

Communication - Overall language ability (WAB-AQ) - Polarity - Higher values are better

Communication - Naming (BNT)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 46	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 41	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 127	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 101	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 18	Speech and Language Therapy - 5+ days per week, 0 month, N = 104	Speech and Language Therapy - 5 days per week, 0 month, N = NA	Speech and Language Therapy - 4 days per week, 0 month, N = 103	Speech and Language Therapy - 3 days per week, 0 month, N = 84	Speech and Language Therapy - up to 2 days per week, 0 month, N = 42
Communication - Naming (BNT) Scale range: 0-60, change scores Mean (95% CI)	2.87 (-3.24 to 8.98)	5.71 (-2.08 to 13.5)	9.7 (2.7 to 16.69)	6.05 (-0.06 to 12.17)	13.83 (5.83 to 20.64)	4.07 (-0.93 to 9.08)	NA (NA to NA)	7.8 (1.23 to 14.37)	6.45 (0.23 to 12.86)	12.06 (5.52 to 17.59)

Communication - Naming (BNT) - Polarity - Higher values are better

Communication - Auditory Comprehension (AAT Token Test)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 141	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 103	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 112	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 120	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 19	Speech and Language Therapy - 5+ days per week, 0 month, N = 51	Speech and Language Therapy - 5 days per week, 0 month, N = 171	Speech and Language Therapy - 4 days per week, 0 month, N = 114	Speech and Language Therapy - 3 days per week, 0 month, N = 89	Speech and Language Therapy - up to 2 days per week, 0 month, N = 64
Communication - Auditory Comprehension	7.3 (4.09 to 10.52)	2.47 (-0.97 to 5.92)	6.01 (1.04 to 10.98)	0.32 (-3.11 to 3.75)	6.5 (1.72 to 11.27)	2.38 (-1.64 to 6.39)	4.63 (1.48 to 7.77)	5.86 (1.64 to 10.08)	1.86 (-2.06 to 5.78)	-0.51 (-4.09 to 3.08)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 141	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 103	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 112	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 120	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 19	Speech and Language Therapy - 5+ days per week, 0 month, N = 51	Speech and Language Therapy - 5 days per week, 0 month, N = 171	Speech and Language Therapy - 4 days per week, 0 month, N = 114	Speech and Language Therapy - 3 days per week, 0 month, N = 89	Speech and Language Therapy - up to 2 days per week, 0 month, N = 64
(AAT Token Test) Scale range: 0-50, change scores Mean (95% CI)										

Communication - Auditory Comprehension (AAT Token Test) - Polarity - Higher values are better

Communication - Functional communication (AAT-SSC)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 60	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 59	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 178	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 73	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 83	Speech and Language Therapy - 5+ days per week, 0 month, N = 9	Speech and Language Therapy - 5 days per week, 0 month, N = 155	Speech and Language Therapy - 4 days per week, 0 month, N = 102	Speech and Language Therapy - 3 days per week, 0 month, N = 93	Speech and Language Therapy - up to 2 days per week, 0 month, N = 82
Communication - Functional communication (AAT-SSC)	0.69 (0.33 to 1.06)	0.53 (0.13 to 0.92)	0.7 (0.35 to 1.06)	0.76 (0.34 to 1.18)	0.77 (0.36 to 1.19)	0.66 (-0.01 to 1.33)	0.78 (0.48 to 1.09)	0.7 (0.25 to 1.15)	0.62 (0.22 to 1.01)	0.52 (0.18 to 0.87)

Outcome	Speech and Language Therapy - 9+ hours per week, 0 month, N = 60	Speech and Language Therapy - 4-9 hours per week, 0 month, N = 59	Speech and Language Therapy - 3-4 hours per week, 0 month, N = 178	Speech and Language Therapy - 2-3 hours per week, 0 month, N = 73	Speech and Language Therapy - Up to 2 hours per week, 0 month, N = 83	Speech and Language Therapy - 5+ days per week, 0 month, N = 9	Speech and Language Therapy - 5 days per week, 0 month, N = 155	Speech and Language Therapy - 4 days per week, 0 month, N = 102	Speech and Language Therapy - 3 days per week, 0 month, N = 93	Speech and Language Therapy - up to 2 days per week, 0 month, N = 82
Scale range: 0-5, change scores Mean (95% CI)										

Communication - Functional communication (AAT-SSC) - Polarity - Higher values are better

Critical appraisal - ROBIS checklist

Section	Question	Answer
Study eligibility criteria	Concerns regarding specification of study eligibility criteria	Low
Identification and selection of studies	Concerns regarding methods used to identify and/or select studies	Unclear *(Based on the absence of information about the search strategy)*

Section	Question	Answer
Data collection and study appraisal	Concerns regarding methods used to collect data and appraise studies	Low
Synthesis and findings	Concerns regarding the synthesis and findings	Unclear *(Due to the limited evidence available discussing how heterogeneity was handled (due to the nature of the interventions there was a reasonable possibility of heterogeneity, therefore the limited evidence appeared to be particularly important in this case))*
Overall study ratings	Overall risk of bias	Low *(While there are some areas where information is missing, the study provided substantial information for other areas and concerns are likely resolved by the use of individual patient data and network meta analysis methodology, which was sufficiently documented. Therefore, this evidence is likely reliable. They report everything required for the PRISMA NMA checklist.)*
Overall study ratings	Applicability as a source of data	Partially applicable *(Includes data from trials where the comparison is to no treatment, which would normally be excluded from this review. We are using outcomes that are not completely relevant to the protocol and are not split appropriately for this.)*

Burgar, 2011

Bibliographic Reference	Burgar, C. G.; Lum, P. S.; Scremin, A. M.; Garber, S. L.; Van der Loos, H. F.; Kenney, D.; Shor, P.; Robot-assisted upper-limb therapy in acute rehabilitation setting following stroke: department of Veterans Affairs multisite clinical trial; Journal of rehabilitation research and development; 2011; vol. 48 (no. 4); 445-458

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	United States of America
Study setting	People at the Veterans Affairs Medical Centre, the Veteran Affairs Greater Los Angeles Healthcare System and the Veteran Affairs Palo Alto Health Care System.
Study dates	No additional information.
Sources of funding	The material was based on work supported by the Veterans Affairs Rehabilitation Research and Development Service (grant B2695I).
Inclusion criteria	Veterans admitted with a primary diagnosis of stroke to the inpatient medical and rehabilitation services; people with a previous ischaemic cerebral event were allowed to participate if they had experienced motor and sensory recovery in the upper limb before the current hospital admission; people admitted to a long-term care unit for rehabilitation were allowed to participate if they were receiving at least 2 hours of rehabilitative therapy 5 or more days per week and met other enrollment criteria.

Exclusion criteria	Upper limb joint pain that restricted normal movement; absent proprioception at the elbow or shoulder joints; scored less than 22 on the Mini-Mental State Examination; people with cardiovascular, orthopedic, or neurological conditions that would have precluded exercise in short duration, moderate workout trials.
Recruitment / selection of participants	Veterans attending the inpatient medical and rehabilitation services
Intervention(s)	Multidisciplinary team - >1 to 2 hours, 5 days a week N=17 Robot assisted upper limb therapy, 30 hours. All therapy was physiotherapists and occupational therapists. Performing movements with continuous direct visualisation of the limbs, using physical objects as targets to maintain a more functional (using physical instead of virtual targets) and goal-directed set of tasks. Movements progressed from passive, with paretic upper-limb motion controlled by the contralateral limb or by the robot in trajectories predetermined by the therapist, to practice of unilateral active-assisted movements followed by practice of actively resisted movements of the affected limb. People were advanced to more challenging tasks consistent with their level of recovery and ability to complete those movements that required less volitional control and strength. Therapy was completed by sitting in a wheelchair at a height adjustable table to which the robot and a digitizer were attached. These used the MIME system which was programmed to provide four modes of robot assisted training (three unilateral and a bilateral mode). Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only Robot (not exactly computer-based tool in the way discussed in the protocol, but it does apply)
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week N=37 Two groups: 1) robot assisted upper limb therapy for 15 hours in total. 2) 15 hours of other therapy over the same time period - therapy to improve the function of the paretic upper limb through a variety of treatment modalities. The therapy was progressive and tailored to the individual's specific stroke diagnosis, level of impairment and residual deficits. Specific

	treatments included soft tissue and joint mobilization at the start of each session, neuromuscular reeducation strategies, isolated progressive resistive exercises, and a progression to functional activities of daily living retraining at the same work station used for the RA sessions. 5 minutes was devoted to exposure to MIME. Concomitant therapy: No additional information.
Number of participants	54
Duration of follow-up	3 weeks (post-intervention) and 6 months
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Intervention factors Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care
Additional comments	No additional information on method of analysis

Study arms

Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 17)
Robot assisted upper limb therapy, 30 hours. All therapy was physiotherapists and occupational therapists. Performing movements with continuous direct visualisation of the limbs, using physical objects as targets to maintain a more functional (using physical instead of virtual targets) and goal-directed set of tasks. Movements progressed from passive, with paretic upper-limb motion controlled by the contralateral limb or by the robot in trajectories predetermined by the therapist, to practice of unilateral active-assisted movements followed by practice of actively resisted movements of the affected limb. People were advanced to more challenging tasks consistent with their level of recovery and ability to complete those movements that required less volitional control and strength. Therapy was completed by sitting in a wheelchair at a height adjustable table to which the robot and a digitizer were attached. These used the MIME system which was programmed to provide four modes of robot assisted training (three unilateral and a bilateral mode). Concomitant therapy: No additional information.

Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 37)
Two groups: 1) robot assisted upper limb therapy for 15 hours in total. 2) 15 hours of other therapy over the same time period - therapy to improve the function of the paretic upper limb through a variety of treatment modalities. The therapy was progressive and tailored to the individual's specific stroke diagnosis, level of impairment and residual deficits. Specific treatments included soft tissue and joint mobilization at the start of each session, neuromuscular reeducation strategies, isolated progressive resistive exercises, and a progression to functional activities of daily living retraining at the same work station used for the RA sessions. 5 minutes was devoted to exposure to MIME. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 17)	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 37)
% Female Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 17)	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 37)
Mean age (SD) (years) Mean (SD)	58.6 (2.3)	65.2 (3.9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	*empty data*
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	16.6 (2.4)	14 (4)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

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

Multidisciplinary team - >1 to 2 hours, 5 days a week compared to Multidisciplinary team - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 17	Multidisciplinary team - >1 to 2 hours, 5 days a week, 3 week, N = 17	Multidisciplinary team - >1 to 2 hours, 5 days a week, 6 month, N = 11	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 37	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 3 week, N = 37	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 6 month, N = 26
Physical function - upper limb (Fugl Meyer upper limb) Scale range: 0-66. Change score. Reported standard errors, due to having to combine the control groups these values were transformed into standard deviations and then combined. Mean (SD)	19 (15.3)	14.4 (14.8)	23.6 (19.2)	25.5 (11.5)	10.3 (12.7)	15.6 (15)
Activities of daily living (Functional Independence Measure, upper limb) Scale range: 0-63. Change scores. Reported standard errors, due to having	27.9 (7)	21.5 (8.7)	27.5 (10)	27.7 (10.1)	16.8 (7.5)	25.4 (10.9)

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 17	Multidisciplinary team - >1 to 2 hours, 5 days a week, 3 week, N = 17	Multidisciplinary team - >1 to 2 hours, 5 days a week, 6 month, N = 11	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 37	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 3 week, N = 37	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 6 month, N = 26
to combine the control groups these values were transformed into standard deviations and then combined. Mean (SD)						

Physical function - upper limb (Fugl Meyer upper limb) - Polarity - Higher values are better
Activities of daily living (Functional Independence Measure, upper limb) - Polarity - Higher values are better

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerupperlimb)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t3

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerupperlimb)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t6

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasure,upperlimb)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t3

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Activitiesofdailyliving(FunctionalIndependenceMeasure,upperlimb)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t6

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

Cabanas-Valdes, 2016

Bibliographic Reference	Cabanas-Valdes, R.; Bagur-Calafat, C.; Girabent-Farres, M.; Caballero-Gomez, F. M.; Hernandez-Valino, M.; Urrutia Cuchi, G.; The effect of additional core stability exercises on improving dynamic sitting balance and trunk control for subacute stroke patients: a randomized controlled trial; Clinical Rehabilitation; 2016; vol. 30 (no. 10); 1024-1033

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	Spain
Study setting	Inpatient rehabilitation hospital in two centres
Study dates	Between October 2012 and March 2014

Sources of funding	The author(s) received no financial support for the research, authorship, and/or publication of this article.
Inclusion criteria	All people (age 18 years or older) who had experienced their first stroke, whether ischaemic or haemorrhagic (not requiring surgery), within the last three months.
Exclusion criteria	Significant disability prior to stroke as evidence by a score of >3 on the modified Rankin scale; a Barthel Index score of at least 75; a Spanish Version of Trunk Impact Scale 2.0 score of at least 10; orthopaedic or neurological impairments that could influence sitting balance; inability to understand instructions as assessed by a Mini Mental State Examination score of no more than 24; apraxia; hemineglect.
Recruitment / selection of participants	People were recruited from the Parc Sanitari Pere Virgili (Barcelona, Spain) and Parc Tauli Sabadell Hospital Universatari (Sabadell, Spain).
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=40 In addition to usual care, people in the experimental group performed core stability exercises for 15 minutes daily, totalling 6.15 hours. All physiotherapists were neurology experts and received one day of education on training in specific exercises by the principal investigator. They performed the therapy with their hands on the patient to ensure proper quality of movement. Adequate rest periods were allowed between exercises. The core stability exercises were selective, repetitive movements and involved tasks without resistance to improve strength, endurance, and coordination of the core. The exercises were gradually increased in difficulty from performing them in a supine position on a plinth or bed, to performing them in a sitting position on a stable surface to performing in a sitting position on a physioball. Concomitant therapy: All people followed the conventional therapy programme for stroke patients provided by their respective rehabilitation centre for a 5-week period, consisting of 1 hour of treatment a day, 5 times a week for 5 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Functional independency Core stability
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team

Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=40 Conventional programme only. The conventional programme was patient-specific and consists mainly of physiotherapy, such as tone facilitation, stretching, passive mobilisation, and range-of-motion exercises for the hemiparetic side, walking between parallel bars, and occupational therapy and nursing care. Additionally, activities of the trunk integrated in postural control and task-directed movement were performed. Concomitant therapy: All people followed the conventional therapy programme for stroke patients provided by their respective rehabilitation centre for a 5-week period, consisting of 1 hour of treatment a day, 5 times a week for 5 weeks.
Number of participants	80
Duration of follow-up	5 weeks (some were followed up at 4 weeks instead, but all results pooled together. The majority were at 5 weeks so this value will be used for the analysis).
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - Care was adapted to the individual (being 'patient-specific') Intervention factors: Individual therapy Environmental factors: Hospital care

Additional comments	Unclear method of analysis (almost no participants missing, but excludes one person who died from the analysis, so may be ITT analysis)

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 40)
In addition to usual care, people in the experimental group performed core stability exercises for 15 minutes daily, totalling 6.15 hours. All physiotherapists were neurology experts and received one day of education on training in specific exercises by the principal investigator. They performed the therapy with their hands on the patient to ensure proper quality of movement. Adequate rest periods were allowed between exercises. The core stability exercises were selective, repetitive movements and involved tasks without resistance to improve strength, endurance, and coordination of the core. The exercises were gradually increased in difficulty from performing them in a supine position on a plinth or bed, to performing them in a sitting position on a stable surface to performing in a sitting position on a physioball. Concomitant therapy: All people followed the conventional therapy programme for stroke patients provided by their respective rehabilitation centre for a 5-week period, consisting of 1 hour of treatment a day, 5 times a week for 5 weeks.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 40)
Conventional programme only. The conventional programme was patient-specific and consists mainly of physiotherapy, such as tone facilitation, stretching, passive mobilisation, and range-of-motion exercises for the hemiparetic side, walking between parallel bars, and occupational therapy and nursing care. Additionally, activities of the trunk integrated in postural control and task-directed movement were performed. Concomitant therapy: All people followed the conventional therapy programme for stroke patients provided by their respective rehabilitation centre for a 5-week period, consisting of 1 hour of treatment a day, 5 times a week for 5 weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 40)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 40)
% Female Sample size	n = 19 ; % = 47.5	n = 21 ; % = 52.5
Mean age (SD) (years) Mean (SD)	74.92 (10.7)	75.69 (9.4)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Mean (SD)	9.42 (5.37)	8.54 (5.06)
Time period since stroke (days) Mean (SD)	25.12 (17.3)	21.37 (16)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 5 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 40	Physiotherapy - >1 to 2 hours, 5 days a week, 5 week, N = 40	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 40	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 5 week, N = 39
Activities of daily living (barthel index) Scale range: 0-100. Change scores. Mean (SD)	32 (15.27)	36.5 (18.81)	30.9 (15.08)	23.33 (16.87)
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Change scores. Mean (SD)	5.42 (5.6)	23.02 (15.95)	8.54 (11.14)	8.48 (8.74)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 40	Physiotherapy - >1 to 2 hours, 5 days a week, 5 week, N = 40	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 40	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 5 week, N = 40
Discontinuation Control: 1 death No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 1 ; % = 2.5

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t5

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t5

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t5

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

Carnaby, 2006

Bibliographic Reference	Carnaby, G.; Hankey, G. J.; Pizzi, J.; Behavioural intervention for dysphagia in acute stroke: a randomised controlled trial; Lancet Neurology; 2006; vol. 5 (no. 1); 31-7

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	NCT00257764
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	University teaching hospital (the Royal Perth Hospital), providing medical services to the eastern suburban region of Perth, Western Australia.
Study dates	No additional information (3 year period).
Sources of funding	This study was supported by an educational grant from the Royal Perth Hospital Medical Research Foundation.
Inclusion criteria	A clinical diagnosis of stroke confirmed by the attending clinician, according to the WHO definition of stroke; onset of stroke within the previous 7 days; study speech pathologist made a clinical diagnosis of swallowing difficulty (dysphagia), as measured by a score of less than 85 on the Paramatta Hospital's assessment of dysphagia; giving informed consent to participate and be followed up for the next 6 months
Exclusion criteria	History of swallowing treatment of surgery of the head or neck
Recruitment / selection of participants	People presenting to the hospital over a 3 year period

Intervention(s)	Speech and language therapists - </= 45 minutes, 7 days a week N=102 Standard high-intensity swallowing therapy consisting of direct swallowing exercises (eg. effortful swallowing, supraglottic swallow technique) and appropriate dietary modification, under the direction of the study speech pathologists, every working day for a month or daily for the duration of the hospital stay (if less than a month). The choice of specific swallowing exercises was established by the findings of the clinical examination and videofluoroscopy (at baseline and at follow up, if necessary). Concomitant therapy: Usual care, consisting of patient management by the attending physicians as per usual practice.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Swallow
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Speech and language therapists - </= 45 minutes, <5 days a week N=102 Standard low-intensity swallowing therapy composed of swallowing compensations strategies, mainly environmental modification (eg, upright positioning for feeding); safe swallowing advice (eg. reduced rate of eating); and appropriate dietary modification, under the direction of the study speech pathologist, three times per week for a month or for the duration of the hospital stay (if less than a month). Concomitant therapy: Usual care, consisting of patient management by the attending physicians as per usual practice.

	A third usual care arm was reported (N=102) that received just the concomitant therapy. This group was not included in the analysis as they did not specify the amount of therapy and a different comparable arm was included discussing high intensity and low intensity therapy.
Number of participants	306
Duration of follow-up	6 months (endpoints analysed at 1 month and 6 months)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Seven-day working Environmental factors Hospital care Service factors: Seven day working
Additional comments	Intention to treat analysis

Study arms

Speech and language therapists - </= 45 minutes, 7 days a week (N = 102)
Standard high-intensity swallowing therapy consisting of direct swallowing exercises (eg. effortful swallowing, supraglottic swallow technique) and appropriate dietary modification, under the direction of the study speech pathologists, every working day for a month or daily for the duration of the hospital stay (if less than a month). The choice of specific swallowing exercises was established by the findings of the clinical examination and videofluoroscopy (at baseline and at follow up, if necessary). Concomitant therapy: Usual care, consisting of patient management by the attending physicians as per usual practice.

Speech and language therapists - </= 45 minutes, <5 days a week (N = 102)
Standard low-intensity swallowing therapy composed of swallowing compensations strategies, mainly environmental modification (eg, upright positioning for feeding); safe swallowing advice (eg. reduced rate of eating); and appropriate dietary modification, under the direction of the study speech pathologist, three times per week for a month or for the duration of the hospital stay (if less than a month). Concomitant therapy: Usual care, consisting of patient management by the attending physicians as per usual practice.

Characteristics

Arm-level characteristics

Characteristic	Speech and language therapists - </= 45 minutes, 7 days a week (N = 102)	Speech and language therapists - </= 45 minutes, <5 days a week (N = 102)
% Female Sample size	n = 42 ; % = 41	n = 43 ; % = 42
Mean age (SD) (years) Mean (SD)	69.8 (12.5)	72 (12.4)
Ethnicity	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Speech and language therapists - </= 45 minutes, 7 days a week (N = 102)	Speech and language therapists - </= 45 minutes, <5 days a week (N = 102)
Sample size		
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Barthel index <15 Sample size	n = 80 ; % = 78	n = 80 ; % = 78
Barthel index at least 15 Sample size	n = 22 ; % = 22	n = 22 ; % = 22
Time period since stroke (days) Length of hospital stay Mean (SD)	19.1 (10.5)	19.2 (13.3)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 month (≥6 months)

Speech and language therapists - </= 45 minutes, 7 days a week compared to Speech and language therapists - </= 45 minutes, <5 days a week at ≥6 months - dichotomous outcomes

Outcome	Speech and language therapists - </= 45 minutes, 7 days a week, Baseline, N = 102	Speech and language therapists - </= 45 minutes, 7 days a week, 6 month, N = 102	Speech and language therapists - </= 45 minutes, <5 days a week, Baseline, N = 102	Speech and language therapists - </= 45 minutes, <5 days a week, 6 month, N = 102
Swallow function and ability (Functional swallow) Dichotomous outcome, protocol specified this outcome should be continuous and so this will be downgraded for indirectness. No of events	n = NA ; % = NA	n = 49 ; % = 48	n = NA ; % = NA	n = 44 ; % = 43
Discontinuation Intervention: 17 died, 2 lost to follow up. Control: 20 died, 1 lost to follow up. No of events	n = NA ; % = NA	n = 19 ; % = 19	n = NA ; % = NA	n = 21 ; % = 21

Swallow function and ability (Functional swallow) - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better

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

Speech and language therapists-</=45minutes,7daysaweekcomparedtoSpeech and language therapists-</=45minutes,<5daysaweekat≥6months-dichotomousoutcomes-Swallowfunctionandability(Functionalswallow)-NoOfEvents-Speech and language therapists - </= 45 minutes, 7 days a week-Speech and language therapists - </= 45 minutes, <5 days a week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(Downgraded for outcome indirectness as the outcome is a dichotomous outcome when the protocol specified continuous outcomes)*

Speech and language therapists-</=45minutes,7daysaweekcomparedtoSpeech and language therapists-</=45minutes,<5daysaweekat≥6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Speech and language therapists - </= 45 minutes, 7 days a week-Speech and language therapists - </= 45 minutes, <5 days a week-t6

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

Cho, 2012

Bibliographic Reference	Cho, K. H.; Lee, K. J.; Song, C. H.; Virtual-reality balance training with a video-game system improves dynamic balance in chronic stroke patients; Tohoku Journal of Experimental Medicine; 2012; vol. 228 (no. 1); 69-74

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	People recruited on a voluntary basis from the stroke unit
Study dates	No additional information
Sources of funding	The present study was supported by Sahmyook University Research Grant.
Inclusion criteria	A hemiparetic status resulting from a single stroke at least 6 months earlier; the ability to walk 10m independently with or without an assistive device; a Mini-Mental State Examination score of at least 24; the absence of a musculoskeletal condition that could potentially affect the ability to walk safely; the absence of serious visual impairment or a hearing disorder.
Exclusion criteria	Severe dementia or aphasia; hemispatial neglect, ataxia or any other cerebellar symptom; participation in other studies or rehabilitation programs.

Recruitment / selection of participants	People were recruited from a stroke unit who were undergoing standard rehabilitation and volunteered for the trial.
Intervention(s)	Occupational therapy - >1 to 2 hours, 5 days a week N=11 Virtual reality balance training in addition to standard rehabilitation for 30 minutes a day, 3 times a week for 6 weeks. This used a conventional 42-inch LCD screen television and a balance board game system (Wii Fit balance board). Communication between the balance board game system and the television was established via Bluetooth protocol. Virtual reality balance training was performed using the balance board game system. In this study, virtual reality balance training was performed using the following games: balance bubble, ski slalom, ski jump, soccer heading, table tiling, and the penguin slide. The training was conducted in a quiet room to ensure the subjects' attention. To prevent subjects from experiencing a fall during training, a therapist stood within arm's reach of the subject. Concomitant therapy: Both groups participation in a standard rehabilitation program (physical and occupational therapy) for 60 minutes a day, 5 times a week for 6 weeks and speech and language therapy (if appropriate).
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed Balance, but also general physiotherapy, occupational therapy and possibly speech and language therapy
Subgroup 5: Type of communication difficulty	Not stated/unclear
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - 45 minutes to 1 hour, 5 days a week N=11 Standard rehabilitation only. Concomitant therapy: Both groups participation in a standard rehabilitation program (physical and occupational therapy) for 60 minutes a day, 5 times a week for 6 weeks and speech and language therapy (if appropriate).

Number of participants	22
Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - A selection of different games were available to choose from Physical environment - Required technology that could be sizable, and required a quiet room. Was conducted in hospital to achieve this. Environmental factors Hospital care Enriched/adapted environment - The environment was a quiet room to ensure the subjects' attention Supervision - Required supervision incase someone fell during the procedure. Use of expensive equipment - Required a 42 inch monitor and a Wii with balance board.

Additional comments	No additional information on method of analysis

Study arms

Occupational therapy - >1 to 2 hours, 5 days a week (N = 11)
Virtual reality balance training in addition to standard rehabilitation for 30 minutes a day, 3 times a week for 6 weeks. This used a conventional 42-inch LCD screen television and a balance board game system (Wii Fit balance board). Communication between the balance board game system and the television was established via Bluetooth protocol. Virtual reality balance training was performed using the balance board game system. In this study, virtual reality balance training was performed using the following games: balance bubble, ski slalom, ski jump, soccer heading, table tiling, and the penguin slide. The training was conducted in a quiet room to ensure the subjects' attention. To prevent subjects from experiencing a fall during training, a therapist stood within arm's reach of the subject. Concomitant therapy: Both groups participation in a standard rehabilitation program (physical and occupational therapy) for 60 minutes a day, 5 times a week for 6 weeks and speech and language therapy (if appropriate).

Occupational therapy - 45 minutes to 1 hour, 5 days a week (N = 11)
Standard rehabilitation only. Concomitant therapy: Both groups participation in a standard rehabilitation program (physical and occupational therapy) for 60 minutes a day, 5 times a week for 6 weeks and speech and language therapy (if appropriate).

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 11)	Occupational therapy - 45 minutes to 1 hour, 5 days a week (N = 11)
% Female	n = 3 ; % = 27.3	n = 5 ; % = 45.5

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 11)	Occupational therapy - 45 minutes to 1 hour, 5 days a week (N = 11)
Sample size		
Mean age (SD) (years) Mean (SD)	65.26 (8.35)	63.13 (6.87)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	12.54 (2.58)	12.63 (2.54)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline

- 6 week (<6 months)

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - 45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 11	Occupational therapy - >1 to 2 hours, 5 days a week, 6 week, N = 11	Occupational therapy - 45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Occupational therapy - 45 minutes to 1 hour, 5 days a week, 6 week, N = 11
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Change score. Mean (SD)	39.09 (5.66)	4 (1.18)	41.09 (4.01)	2.81 (0.4)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - 45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcomes

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 11	Occupational therapy - >1 to 2 hours, 5 days a week, 6 week, N = 11	Occupational therapy - 45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Occupational therapy - 45 minutes to 1 hour, 5 days a week, 6 week, N = 11
Discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Occupational therapy->1to2hours,5daysaweekcomparedtoOccupational therapy-45minutesto1hour,5daysaweekat<6monthsdichotomousoutcomes-Discontinuation-NoOfEvents-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - 45 minutes to 1 hour, 5 days a week-t6

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

Occupational therapy->1to2hours,5daysaweekcomparedtoOccupational therapy-45minutesto1hour,5daysaweekat<6months--continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - 45 minutes to 1 hour, 5 days a week-t6

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

Cooke, 2010

Bibliographic Reference	Cooke, E. V.; Tallis, R. C.; Clark, A.; Pomeroy, V. M.; Efficacy of functional strength training on restoration of lower-limb motor function early after stroke: phase I randomized controlled trial; Neurorehabilitation and neural repair; 2010; vol. 24 (no. 1); 88-96

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	NCT00322192
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	Multiple clinical centres
Study dates	No additional information
Sources of funding	Funding was provided by the Healthcare Foundation and the Dowager Countess Eleanor Peel Trust
Inclusion criteria	People were inpatients older than 18 years, between 1 and 13 weeks after anterior circulatory stroke (haemorrhage or infarction); some voluntary muscle contraction in the paretic lower limb (a score of at least 28/100 on the lower limb section of the motricity index), with potential for clinically important improvement was present; they were able to follow a 1-stage command; they were independently mobile, with or without aids, prior to the index stroke
Exclusion criteria	Orthopedic surgery and trauma affecting the lower limb in the last 8 weeks; previous history of neurological disease other than stroke.

Recruitment / selection of participants	People were recruited from 4 clinical centres (3 were initial centres, one was added in the trial's last year to increase the sample size).
Intervention(s)	Physiotherapy - >1 to 2 hours, <5 days a week N=71 Functional strength training and conventional physiotherapy (n=36) or conventional physiotherapy in addition to conventional physiotherapy (n=35). All additional therapy was provided for up to 1 hour, 4 days a week for 6 weeks by research physiotherapists who were independent of the clinical team. Functional strength training incorporated specific functional tasks or specific movements in preparation for functional tasks using a therapist hands-off approach while maintaining patient safety. Verbal prompting rather than sensory feedback was used by the therapist. Activities are progressed systematically using repetition and resistance. This included one or more sets of 10 repetitions of the same specific task, with up to 5 sets of 10 repetitions. This included systematic progression in treatment activities from increasing the individual's bodyweight that they need to move and also the distance over which they need to move it. Conventional physiotherapy included hand-on therapy with an emphasis on preparation and joint alignment via sensory input. Some practices of functional tasks included walking, but as a context for hand-on interventions or to demonstrate to an individual how much they are able to do. No systematic progression of repetition or resistance. Five or fewer repetitions of the same specific task. Concomitant therapy: Conventional physical therapy. People were allocated to therapy but did not receive any additional therapy. This therapy was provided for up to 1 hour, 4 days a week for 6 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - 45 minutes to 1 hour, <5 days a week N=38 Conventional physiotherapy only.

	Concomitant therapy: Conventional physical therapy. People were allocated to therapy but did not receive any additional therapy. This therapy was provided for up to 1 hour, 4 days a week for 6 weeks.
Number of participants	109
Duration of follow-up	12 weeks (measured at 6 weeks after baseline and at follow up 12 weeks thereafter)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Environmental factors: Hospital care
Additional comments	Intention to treat analysis

Study arms

Physiotherapy - >1 to 2 hours, <5 days a week (N = 71)
Functional strength training and conventional physiotherapy (n=36) or conventional physiotherapy in addition to conventional physiotherapy (n=35). All additional therapy was provided for up to 1 hour, 4 days a week for 6 weeks by research physiotherapists who were independent of the clinical team. Functional strength training incorporated specific functional tasks or specific movements in

preparation for functional tasks using a therapist hands-off approach while maintaining patient safety. Verbal prompting rather than sensory feedback was used by the therapist. Activities are progressed systematically using repetition and resistance. This included one or more sets of 10 repetitions of the same specific task, with up to 5 sets of 10 repetitions. This included systematic progression in treatment activities from increasing the individual's bodyweight that they need to move and also the distance over which they need to move it. Conventional physiotherapy included hand-on therapy with an emphasis on preparation and joint alignment via sensory input. Some practices of functional tasks included walking, but as a context for hand-on interventions or to demonstrate to an individual how much they are able to do. No systematic progression of repetition or resistance. Five or fewer repetitions of the same specific task. Concomitant therapy: Conventional physical therapy. People were allocated to therapy but did not receive any additional therapy. This therapy was provided for up to 1 hour, 4 days a week for 6 weeks.

Physiotherapy - 45 minutes to 1 hour, <5 days a week (N = 38)
Conventional physiotherapy only. Concomitant therapy: Conventional physical therapy. People were allocated to therapy but did not receive any additional therapy. This therapy was provided for up to 1 hour, 4 days a week for 6 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, <5 days a week (N = 71)**	**Physiotherapy - 45 minutes to 1 hour, <5 days a week (N = 38)**
% Female Sample size	n = 27 ; % = 38	n = 17 ; % = 45
Mean age (SD) (years) Mean (SD)	69.34 (11.1)	66.37 (13.7)
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Physiotherapy - >1 to 2 hours, <5 days a week (N = 71)	Physiotherapy - 45 minutes to 1 hour, <5 days a week (N = 38)
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Time period since stroke (days) Mean (SD)	33.16 (19.03)	36.76 (22.41)
Type of communication difficulty Sample size	n = NA ; % = NA	n = NA ; % = NA

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - 45 minutes to 1 hour, <5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 71	Physiotherapy - >1 to 2 hours, <5 days a week, 12 week, N = 71	Physiotherapy - 45 minutes to 1 hour, <5 days a week, Baseline, N = 38	Physiotherapy - 45 minutes to 1 hour, <5 days a week, 12 week, N = 38
Person/participant generic health-related quality of life (EQ-5D 5L) Scale range: -0.11-1. Final values. Mean (SD)	0.39 (0.38)	0.6 (0.28)	0.39 (0.33)	0.6 (0.29)
Physical function - lower limb (Modified Rivermead mobility index) Scale range: 0-40. Final values. Mean (SD)	29.6 (10.6)	38.3 (8.7)	29.4 (10.1)	39.7 (5.7)

Person/participant generic health-related quality of life (EQ-5D 5L) - Polarity - Higher values are better
Physical function - lower limb (Modified Rivermead mobility index) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - 45 minutes to 1 hour, <5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 71	Physiotherapy - >1 to 2 hours, <5 days a week, 12 week, N = 71	Physiotherapy - 45 minutes to 1 hour, <5 days a week, Baseline, N = 38	Physiotherapy - 45 minutes to 1 hour, <5 days a week, 12 week, N = 38
Discontinuation CPT+FST = 5 unwell, 2 withdrew.	n = NA ; % = NA	n = 14 ; % = 20	n = NA ; % = NA	n = 14 ; % = 37

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 71	Physiotherapy - >1 to 2 hours, <5 days a week, 12 week, N = 71	Physiotherapy - 45 minutes to 1 hour, <5 days a week, Baseline, N = 38	Physiotherapy - 45 minutes to 1 hour, <5 days a week, 12 week, N = 38
CPT+CPT = 5 unwell, 1 sectioned, 1 withdrew. Control: 5 unwell, 4 withdrew, 1 abroad, 2 housebound, 2 died No of events				

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D5L)-MeanSD-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - 45 minutes to 1 hour, <5 days a week-t12

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(ModifiedRivermeadmobilityindex)-MeanSD-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - 45 minutes to 1 hour, <5 days a week-t12

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-45minutesto1hour,<5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - 45 minutes to 1 hour, <5 days a week-t12

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

Coskunsu, 2022

Bibliographic Reference	Coskunsu, Dilber Karagozoglu; Akcay, Sumeyye; Ogul, Ozden Erkan; Akyol, D Kubra; Ozturk, Necla; Zileli, Fusun; Tuzun, Birgul Bastan; Krespi, Yakup; Effects of robotic rehabilitation on recovery of hand functions in acute stroke: A preliminary randomized controlled study.; Acta neurologica Scandinavica; 2022; vol. 146 (no. 5); 499-511

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NCT03571529
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	Inpatients in Istanbul Aydın University Medicalpark Florya Hospital
Study dates	NR
Sources of funding	This study was supported, in part, by the Rehab Robotic Company. This sponsor did not have a role in the design of the registry; the collection, analysis or interpretation of data or the writing or approval of the manuscript.
Inclusion criteria	First ischemic stroke within 4 weeks after onset, Being 18 and older, Having sitting balance and being able to maintain at least an hour, Montreal Cognitive Assessment Scale 46 score more than 21, Visible or palpable contraction (MMT ≥1) in the finger flexor and/ or extensor muscles of the hand, Full range of motion in MCP, PIP and DIP joints, Modified Ashworth Scale (MAS) ≤ 3 for finger flexors and extensors, Willingness to participate in the study.
Exclusion criteria	Other neurologic or orthopedic problems that may affect the upper extremity functions, Hemispatial neglect (diagnosed by Line bisection test47 and The Star Cancellation Test48), MAS >3 (constant testing of the spasticity using MAS throughout the rehabilitation)

Recruitment / selection of participants	Patients admitted to Istanbul Aydın University Medicalpark Florya Hospital were screened for eligibility criteria from March 2018 to July 2019.
Intervention(s)	Robot assisted rehabilitation - In addition to usual care, participants in the EG received robotic rehabilitation with device named as Hand of Hope (an EMG-driven exoskeleton), daily, 5 days/week for 3 consecutive weeks (totally 15 sessions). There were three options in the treatment modes: Continuous Passive Motion (CPM), trigger & go and trigger & maintain. In the CPM mode, hand opening and grasping were passively done by robotic system itself and the patient was not required to do a voluntary movement. HOH system also had 3 different options for treatment: hand grasping, hand opening and hand grasping & opening. The patient's hand was placed inside the robot and fixed with velcro. Surface EMG electrodes were placed on the ED and FDS muscles according to the user manual of the device. Each robot-assisted training session lasted for approximately 1 h. Each treatment protocol was as follows: Initially treatment started with CPM mode for 10 min for warming up, then hand opening and grasping in the trigger & go or trigger & maintain mode, hand opening in the trigger & go or trigger & maintain mode and hand grasping in the trigger & go or trigger & maintain mode, each 10 min in duration, applied sequentially with 2 min of resting between sequences. Concomitant therapy - Participants in the EG and CG received 15 sessions of the neurophysiologic treatment delivered 5 times a week over 3 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	NR
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months) within 4 weeks
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	This treatment program, which was applied to both groups in the study, consisted of early Bobath exercises, neurophysiological approaches including combinations of Brunnstrom, Johnstone and PNF exercises and electrical stimulation selected according to the patient's condition. The session lasted 1 h (30 min for upper extremity, 30 min for lower extremity).

Number of participants	24
Duration of follow-up	3 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	Individual therapy Hospital care Physical environment - Required technology that could be sizable, and required a quiet room. Was conducted in hospital to achieve this. Use of expensive equipment
Additional comments	NR

Study arms

Physiotherapy - >1-2 hours, 5 days a week, (N = 11)
Robot assisted rehabilitation - In addition to usual care, participants in the EG received robotic rehabilitation with device named as Hand of Hope (an EMG-driven exoskeleton), daily, 5 days/week for 3 consecutive weeks (totally 15 sessions). There were three

options in the treatment modes: Continuous Passive Motion (CPM), trigger&go and trigger&maintain. In the CPM mode, hand opening and grasping were passively done by robotic system itself and the patient was not required to do a voluntary movement. HOH system also had 3 different options for treatment: hand grasping, hand opening and hand grasping & opening. The patient's hand was placed inside the robot and fixed with velcro. Surface EMG electrodes were placed on the ED and FDS muscles according to the user manual of the device. Each robot-assisted training session lasted for approximately 1 h. Each treatment protocol was as follows: Initially treatment started with CPM mode for 10 min for warming up, then hand opening and grasping in the trigger&go or trigger&maintain mode, hand opening in the trigger&go or trigger&maintain mode and hand grasping in the trigger&go or trigger&maintain mode, each 10 min in duration, applied sequentially with 2 min of resting between sequences. Concomitant therapy - Participants in the EG and CG received 15 sessions of the neurophysiologic treatment delivered 5 times a week over 3 weeks.

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 9)
This treatment program, which was applied to both groups in the study, consisted of early Bobath exercises, neurophysiological approaches including combinations of Brunnstrom, Johnstone and PNF exercises and electrical stimulation selected according to the patient's condition. The session lasted 1 h (30 min for upper extremity, 30 min for lower extremity).

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1-2 hours, 5 days a week, (N = 11)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 9)
% Female Sample size	n = 7 ; % = 64	n = 2 ; % = 22
Mean age (SD) Mean (SD)	59.9 (14.3)	70 (14)
Ethnicity	NR	NR

Characteristic	Physiotherapy - >1-2 hours, 5 days a week, (N = 11)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 9)
Nominal		
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Time period since stroke Nominal	NR	NR
Type of communication difficulty Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 3 week

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, , Baseline, N = 11	Physiotherapy - >1-2 hours, 5 days a week, , 3 week, N = 11	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 9	Physiotherapy - >45 minutes-1 hour, 5 days a week, 3 week, N = 9
Physical function - upper limb (ARAT total score) Scale range: 0-57. Change scores. Mean (SD)	20.27 (21.31)	15.73 (14.41)	12.67 (12.76)	20 (11.61)

Physical function - upper limb (ARAT total score) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, , Baseline, N = 12	Physiotherapy - >1-2 hours, 5 days a week, , 3 week, N = 12	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes-1 hour, 5 days a week, 3 week, N = 12
Discontinutation from study intervention reasons - (Takeayasu's arteritis). Control - distance, cardiac operation) No of events	n = NA ; % = NA	n = 1 ; % = 8.3	n = NA ; % = NA	n = 3 ; % = 25

Discontinutation from study - Polarity - Lower values are better

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

Dichotomousoutcomes-Discontinutationfromstudy-NoOfEvents-Physiotherapy - 1-2 hours, 5 days a week, -Physiotherapy - 45 minutes - 1 hour, 5 days a week-t3

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

Continuousoutcomes-ARATtotalscore(changescore)-MeanSD-Physiotherapy - 1-2 hours, 5 days a week, -Physiotherapy - 45 minutes - 1 hour, 5 days a week-t3

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

Cui, 2022

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

Study details

Secondary publication of	No additional information.

another included study- see primary study for details	
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Outpatient follow up.
Study dates	March 2016 to June 2017
Sources of funding	This work is financially supported by Sichuan Province Pharmaceutical Administration (Grant No. 2014B064), the Key R&D Program of Sichuan Province (No.2020YFS0415).
Inclusion criteria	People who experienced a first-ever ischaemic stroke with lesions limited to one hemisphere, and the symptoms met the diagnostic criteria stated in the "Guidelines for the diagnostics and treatment of acute ischaemic stroke in China" set by the Neurology Subcommittee of the Chinese Medical Association in 2014. All people were diagnosed with ischaemic stroke by head CT or MRI; people were in stable conditions, when the people were enrolled in the study, they were within 30 days from the onset of ischaemic stroke; people exhibited hemiplegia; modified Ashworth scale for lower extremity was not higher than 2; Brunnstrom score for the lower extremity was between I and IV; people showed no cognitive impairment that would affect their ability to cooperate with their treatment. Their Mini Mental State Examination score was greater than 23; people could keep static balance in the sitting position; people were right handed.
Exclusion criteria	People showed unstable vital signs; people had a history of cerebrovascular diseases with sequelae that impaired neural or motor functions; people had a history of epilepsy, dementia, depression or other conditions that may compromise the brain

	function; people had psychological conditions, cognitive impairment and other medical conditions that would affect the patients' ability act within the study protocol; people had metal implants or other medical conditions that are unsuitable for MRI examination; people had impaired vision.
Recruitment / selection of participants	32 patients with ischemic stroke who were treated at the Department of Rehabilitation of Sichuan Provincial People's Hospital from March 2016 to June 2017 were recruited and randomly divided into the control group (CT) and the mirror therapy group (MT) with 16 patients in each group.
Intervention(s)	Physiotherapy - <45 minutes, 5 days a week N=16 Mirror therapy 5 times a week for 30 minutes each time over 3 weeks in addition to usual care. This was provided in a quiet environment. People were seated in a stable chair with a mirror of 85cm x 189cm placed in front of them in the sagittal plane. Their legs were located on either side of the mirror. The non-paretic limb was placed on the reflective side. People were asked to perform the instructions with both limbs, but to view the image of the non-paretic limb and image that this is what the affected side is moving as. If the limb is not able to actively move, the therapist could assist the movement behind the mirror. People were asked to complete five sets of the movement, including both internal and external rotation of the hip joint, dorsiflexion and plantar flexion of the ankle joint and varus and valgus of the ankle joint, with each movement reaching the maximum range of the joint motion. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	NR

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists

Comparator	Physiotherapy - usual care N=16 Usual care only. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.
Number of participants	32
Duration of follow-up	3 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	in person and individual therapy
Additional comments	NR

Study arms

Physiotherapy - <45 minutes, 5 days a week (N = 16)
Mirror therapy 5 times a week for 30 minutes each time over 3 weeks in addition to usual care. This was provided in a quiet environment. People were seated in a stable chair with a mirror of 85cm x 189cm placed in front of them in the sagittal plane. Their legs were located on either side of the mirror. The non-paretic limb was placed on the reflective side. People were asked to perform the instructions with both limbs, but to view the image of the non-paretic limb and image that this is what the affected side is moving as. If the limb is not able to actively move, the therapist could assist the movement behind the mirror. People were asked to complete five sets of the movement, including both internal and external rotation of the hip joint, dorsiflexion and plantar flexion of the ankle joint and varus and valgus of the ankle joint, with each movement reaching the maximum range of the joint motion. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.

Physiotherapy - usual care (N = 16)
Usual care only. Concomitant therapy: Both groups received medication and routine rehabilitation therapy. Routine rehabilitation included good limb positioning, maintenance and improvement of joint mobility, control of muscle tension, promotion of active movement, transfer training, balance training, gait training, occupational therapy and traditionally Chinese medicine rehabilitation such as acupuncture. The amount of time this was provided for was not specified.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - <45 minutes, 5 days a week (N = 16)	Physiotherapy - usual care (N = 16)
% Female Sample size	n = 7 ; % = 43.8	n = 5 ; % = 50

Characteristic	Physiotherapy - <45 minutes, 5 days a week (N = 16)	Physiotherapy - usual care (N = 16)
Mean age (SD) Mean (SD)	61.5 (9.93)	58.5 (11.15)
Ethnicity Nominal	NR	NR
Comorbidities Nominal	NR	NR
Severity Nominal	NR	NR
Time period since stroke days Mean (SD)	21.38 (5.19)	20 (4.42)
Type of communication difficulty Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 3 week

Continuous outcomes

Outcome	Physiotherapy - <45 minutes, 5 days a week, Baseline, N = 16	Physiotherapy - <45 minutes, 5 days a week, 3 week, N = 16	Physiotherapy - usual care, Baseline, N = 16	Physiotherapy - usual care, 3 week, N = 16
Physical function - lower limb (FMA - LE) Scale range: 0-34. Final values. Mean (SD)	10.06 (6.64)	22.44 (6.51)	11.31 (6.37)	17.94 (5.74)
Activities of daily living (Modified Barthel Index) Scale range: 0-100. Change scores. Mean (SD)	20.5 (8.78)	43.75 (14.25)	NR (NR)	20.25 (12.22)

Physical function - lower limb (FMA - LE) - Polarity - Higher values are better
Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better

dichotomous outcomes

Outcome	Physiotherapy - <45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - <45 minutes, 5 days a week, 3 week, N = 19	Physiotherapy - usual care, Baseline, N = 20	Physiotherapy - usual care, 3 week, N = 20
Discontinuation from study reasons - intervention = 2 discharged, 1 lack of time, control = 1 thrombosis, 2 discharged, 1 not willing to have FMRI No of events	n = NA ; % = NA	n = 3 ; % = 15.8	n = NA ; % = NA	n = 4 ; % = 20

Discontinuation from study - Polarity - Lower values are better

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

Continuousoutcomes-Activitiesofdailyliving-modifiedBarthelindexchangescore-MeanSD-Physiotherapy < 45 minutes, 5 days a week-Physiotherapy - usual care-t3

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

Continuousoutcomes-Physicalfunction-lowerlimb(FMA-LE)-MeanSD-Physiotherapy - <45 minutes, 5 days a week-Physiotherapy - usual care-t3

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

dichotomousoutcomes-Discontinuationfromstudy-NoOfEvents-Physiotherapy - <45 minutes, 5 days a week-Physiotherapy - usual care-t3

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Dai, 2013

Bibliographic Reference	Dai, C. Y.; Huang, Y. H.; Chou, L. W.; Wu, S. C.; Wang, R. Y.; Lin, L. C.; Effects of primary caregiver participation in vestibular rehabilitation for unilateral neglect patients with right hemispheric stroke: a randomized controlled trial; Neuropsychiatric Disease and Treatment; 2013; vol. 9; 477-84

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	Central Taiwan
Study setting	Rehabilitation wards of two medical centres located in central Taiwan.
Study dates	No additional information
Sources of funding	They disclose no conflicts of interest - 'no commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit upon the authors or upon any organization with which the authors are associated).
Inclusion criteria	Stroke survivors: Being diagnosed by physicians, computed tomography, or magnetic resonance imaging scan of the brain as having experienced a right hemispheric stroke, including haemorrhagic or ischaemic strokes, and first-time stroke with a duration of less than 6 months from the stroke onset; meeting the conditions for neglect on any of the two scales within the Behavioural Inattention Test Convention subtest; capable of communicating in Mandarin Chinese or Taiwanese and understanding instructions. Caregivers: Being defined as primary caregivers by patients during inpatient rehabilitation, including family members, friends, employed nursing aides and foreign caregivers; willing to participate in supervising and guiding the patients' VR training; capable of communicating in Mandarin Chinese or Taiwanese.
Exclusion criteria	Recurrent stroke with duration of more than 6 months from stroke onset; less than two subtests (BITC) of diagnosed neglect; incapability to communicate; lack of primary caregivers.
Recruitment / selection of participants	People on wards at the Taiwanese medical centres
Intervention(s)	Occupational therapy - >2 to 4 hours, 5 days a week N=27 Vestibular rehabilitation. Trained by a registered nurse once a day for 30 minutes for a total of 10 sessions over 2 weeks. Then during the third and fourth weeks, was supervised and guided to use vestibular rehabilitation by their primary caregivers (who were also trained during the first week). Each session lasted for approximately 5-10 minutes, with the primary caregivers requiring two to four sessions (approximately 20 minutes to 40 minutes in total) before being able to supervise and guide the patient's VR correctly. With their eyes open, the patients moved their head up and down for 20 times or for 1 minute. They also moved their head from side to side for 20 times or for 1 minute; with their eyes closed, the

	patients moved their head up and down for 20 times or for 1 minute. They also moved their head from side to side for 20 times or for 1 minute; the polypropylene corrugated board was placed on the trainers' thighs. The target was at the same height as the patients' eyes. The patients gazed at the target while moving their head up and down and from side to side for 20 times; the patients rested as necessary. The patients performed steps one to three repeatedly, and the entire process took approximately 30 minutes. Concomitant therapy: Conventional rehabilitation. All people received 2 hours of convention rehabilitation, specifically 1 hour for physical therapy and 1 hour for occupational therapy (for a total of 5 days a week). The exercise training for the physical therapy included passive exercises, active exercises, resistive exercises, ambulation training and so on. The occupational therapy included maintaining or improving physiological functions such as endurance, balance and training, to improve activities of daily living, such as dressing, using the toilet, sanitation, home care and others.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Mixed Physical function, activities of daily living
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team Nurses, physiotherapists and occupational therapists
Comparator	Occupational therapy - >1 to 2 hours, 5 days a week N=28 Conventional rehabilitation only Concomitant therapy: Conventional rehabilitation. All people received 2 hours of convention rehabilitation, specifically 1 hour for physical therapy and 1 hour for occupational therapy (for a total of 5 days a week). The exercise training for the physical therapy included passive exercises, active exercises, resistive exercises, ambulation training and so on. The occupational therapy included maintaining or improving physiological functions such as endurance, balance and training, to improve activities of daily living, such as dressing, using the toilet, sanitation, home care and others.
Number of participants	55

Duration of follow-up	28 days (2 weeks after the end of intervention, follow up available at 14 days and 28 days)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Support from family and friends - primary caregiver (which could be family) was involved in the intervention Intervention factors Individual therapy 'Homework'/self management interventions Intervention themes: Need for technical support and training - training of the stroke survivor and primary caregiver Environmental factors: Hospital care Supervision - Supervision required from either a nurse or a primary caregiver
Additional comments	No additional information (24 people analysed in each group, baseline characteristics only reported for this group, not ITT).

Study arms

Occupational therapy - >2 to 4 hours, 5 days a week (N = 27)
Vestibular rehabilitation. Trained by a registered nurse once a day for 30 minutes for a total of 10 sessions over 2 weeks. Then during the third and fourth weeks, was supervised and guided to use vestibular rehabilitation by their primary caregivers (who were also trained during the first week). each session lasted for approximately 5-10 minutes, with the primary caregivers requiring two to four sessions (approximately 20 minutes to 40 minutes in total) before being able to supervise and guide the patient's VR correctly. With their eyes open, the patients moved their head up and down for 20 times or for 1 minute. They also moved their head from side to side for 20 times or for 1 minute; with their eyes closed, the patients moved their head up and down for 20 times or for 1 minute. They also moved their head from side to side for 20 times or for 1 minute; the polypropylene corrugated board was placed on the trainers' thighs. The target was at the same height as the patients' eyes. The patients gazed at the target while moving their head up and down and from side to side for 20 times; the patients rested as necessary. The patients performed steps one to three repeatedly, and the entire process took approximately 30 minutes. Concomitant therapy: Conventional rehabilitation. All people received 2 hours of convention rehabilitation, specifically 1 hour for physical therapy and 1 hour for occupational therapy (for a total of 5 days a week). The exercise training for the physical therapy included passive exercises, active exercises, resistive exercises, ambulation training and so on. The occupational therapy included maintaining or improving physiological functions such as endurance, balance and training, to improve activities of daily living, such as dressing, using the toilet, sanitation, home care and others.

Occupational therapy - >1 to 2 hours, 5 days a week (N = 28)
Conventional rehabilitation only Concomitant therapy: Conventional rehabilitation. All people received 2 hours of convention rehabilitation, specifically 1 hour for physical therapy and 1 hour for occupational therapy (for a total of 5 days a week). The exercise training for the physical therapy included passive exercises, active exercises, resistive exercises, ambulation training and so on. The occupational therapy included maintaining or improving physiological functions such as endurance, balance and training, to improve activities of daily living, such as dressing, using the toilet, sanitation, home care and others.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >2 to 4 hours, 5 days a week (N = 27)	Occupational therapy - >1 to 2 hours, 5 days a week (N = 28)
% Female Sample size	n = 8 ; % = 33.33	n = 12 ; % = 50
Mean age (SD) (years) Mean (SD)	57.21 (12.23)	64.54 (14.67)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	56.88 (38.93)	73.88 (37.86)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 28 day (<6 months)

Occupational therapy - >2 to 4 hours, 5 days a week compared to Occupational therapy - >1 to 2 hours, 5 days a week at <6 months - continuous outcomes

Outcome	Occupational therapy - >2 to 4 hours, 5 days a week, Baseline, N = 27	Occupational therapy - >2 to 4 hours, 5 days a week, 28 day, N = 24	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 28	Occupational therapy - >1 to 2 hours, 5 days a week, 28 day, N = 24
Activities of daily living (functional independence measure) Scale range: 13-91. Final values. Mean (SD)	58.08 (20.59)	76.21 (23.08)	56.42 (20.1)	65.17 (21.55)
Physical function - Lower limb (Postural Assessment Scale for Stroke patients) Scale range: 0-36. Final values. Mean (SD)	12.88 (9.09)	21.54 (7.16)	14 (8.11)	18.04 (7.04)
Stroke-related scale of cognition - Spatial attention (Behavioural Inattention test conventional) Scale range: 0-146 Mean (SD)	49.71 (39.63)	88.71 (44.56)	48.79 (44.64)	68.83 (44.72)

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

Physical function - Lower limb (Postural Assessment Scale for Stroke patients) - Polarity - Higher values are better
Stroke-related scale of cognition - Spatial attention (Behavioural Inattention test conventional) - Polarity - Higher values are better

Occupational therapy - >2 to 4 hours, 5 days a week compared to Occupational therapy - >1 to 2 hours, 5 days a week at <6 months - dichotomous outcome

Outcome	Occupational therapy - >2 to 4 hours, 5 days a week, Baseline, N = 27	Occupational therapy - >2 to 4 hours, 5 days a week, 28 day, N = 27	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 28	Occupational therapy - >1 to 2 hours, 5 days a week, 28 day, N = 28
Discontinuation Intervention: 1 depression, 1 upper GI bleeding, 1 transfer to another hospital. Control: 2 declined, 1 asthma attack, 1 transfer to another hospital. No of events	n = NA ; % = NA	n = 3 ; % = 11.1	n = NA ; % = NA	n = 4 ; % = 14.3

Discontinuation - Polarity - Lower values are better

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

Occupational therapy->2to4hours,5daysaweekcomparedtoOccupational therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >2 to 4 hours, 5 days a week-Occupational therapy - >1 to 2 hours, 5 days a week-t28

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

Occupational therapy->2to4hours,5daysaweekcomparedtoOccupational therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-PhysicalfunctionLowerlimb(PosturalAssessmentScaleforStrokepatients)-MeanSD-Occupational therapy - >2 to 4 hours, 5 days a week-Occupational therapy - >1 to 2 hours, 5 days a week-t28

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

Occupational therapy->2to4hours,5daysaweekcomparedtoOccupational therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Stroke-relatedscaleofcognition-Spatialattention(BehaviourallnattentiontestconventionalMeanSD-Occupational therapy - >2 to 4 hours, 5 days a week-Occupational therapy - >1 to 2 hours, 5 days a week-t28

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

Occupational therapy->2to4hours,5daysaweekcomparedtoOccupational therapy->1to2hours,5daysaweekat<6months-dichotomousoutcomeDiscontinuationNoOfEvents-Occupational therapy - >2 to 4 hours, 5 days a week-Occupational therapy - >1 to 2 hours, 5 days a week-t28

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

de Diego, 2013

Bibliographic Reference	de Diego, C.; Puig, S.; Navarro, X.; A sensorimotor stimulation program for rehabilitation of chronic stroke patients; Restorative Neurology & Neuroscience; 2013; vol. 31 (no. 4); 361-71

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	Spain
Study setting	A rehabilitation centre
Study dates	No additional information
Sources of funding	No additional information

Inclusion criteria	People who suffered a stroke more than 6 months ago who were receiving conventional rehabilitation therapy according to the Bobath concept, in sessions of one hour at our rehabilitation center
Exclusion criteria	No additional information
Recruitment / selection of participants	People were recruited from those attending the center
Intervention(s)	Occupational therapy - >1 to 2 hours, 5 days a week N=12 Exercise group who received 16 sessions of a protocol of 1 hour at the center during 8 weeks, 2 sessions per week and 1 daily session of 30 minutes of functional activity training at home (5 days a week). In total the therapist devoted 16 hours of therapy per patient and the patient invested 28 hours of their time. During the rehabilitation sessions at the centre the patients had restricted use of the unaffected upper limb by using a rigid mitten that avoids both movement and sensory inputs to the hand, subjected at the patient's back to avoid motion of elbow and shoulder joints. This position makes the unaffected upper limb out of the sight of the patient. This is a difference with the traditional constraint induced movement therapy. Therapy included functional activity training, tactile stimulation, mental imagination and practice of activities of daily living. Concomitant therapy: No additional information
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - </= 45 minutes, <5 days a week N=9 Usual treatment according to the Bobath concept (1 hour per session), without prioritizing therapy of the upper limb, with 2 sessions per week.

	Concomitant therapy: No additional information
Number of participants	21
Duration of follow-up	8 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy 'Homework'/self management interventions
Additional comments	No information about method of analysis

Study arms

Occupational therapy - >1 to 2 hours, 5 days a week (N = 12)
Exercise group who received 16 sessions of a protocol of 1 hour at the center during 8 weeks, 2 sessions per week and 1 daily session of 30 minutes of functional activity training at home (5 days a week). In total the therapist devoted 16 hours of therapy per patient and the patient invested 28 hours of their time. During the rehabilitation sessions at the centre the patients had restricted use of the unaffected upper limb by using a rigid mitten that avoids both movement and sensory inputs to the hand, subjected at the patient's back to avoid motion of elbow and shoulder joints. This position makes the unaffected upper limb out of the sight of the patient. This is

a difference with the traditional constraint induced movement therapy. Therapy included functional activity training, tactile stimulation, mental imagination and practice of activities of daily living. Concomitant therapy: No additional information

Occupational therapy - </= 45 minutes, <5 days a week (N = 9)
Usual treatment according to the Bobath concept (1 hour per session), without prioritizing therapy of the upper limb, with 2 sessions per week. Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - >1 to 2 hours, 5 days a week (N = 12)**	**Occupational therapy - </= 45 minutes, <5 days a week (N = 9)**
% Female Sample size	n = NR	n = NR ; % = NR
Mean age (SD) (years) Mean (SD)	61.9 (9.7)	60.6 (15.6)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 12)	Occupational therapy - </= 45 minutes, <5 days a week (N = 9)
Time period since stroke (Months) Mean (SD)	44.7 (24.5)	60.7 (58.2)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - </= 45 minutes, <5 days a week at <6 months - continuous outcomes

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 12	Occupational therapy - >1 to 2 hours, 5 days a week, 8 week, N = 12	Occupational therapy - </= 45 minutes, <5 days a week, Baseline, N = 9	Occupational therapy - </= 45 minutes, <5 days a week, 8 week, N = 9
Patient/participant generic health-related quality of life (Stroke Impact Scale-16) Scale range: 0-100. Change scores.	53.4 (3)	9.83 (1.91)	61.5 (9.3)	0.25 (3.12)

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 12	Occupational therapy - >1 to 2 hours, 5 days a week, 8 week, N = 12	Occupational therapy - </= 45 minutes, <5 days a week, Baseline, N = 9	Occupational therapy - </= 45 minutes, <5 days a week, 8 week, N = 9
Mean (SD)				
Physical function - upper limb (Fugl Meyer Assessment) Scale range: 0-66. Change scores. Mean (SD)	24.3 (4.6)	5.1 (1.1)	33.7 (7.3)	3 (0.85)

Patient/participant generic health-related quality of life (Stroke Impact Scale-16) - Polarity - Higher values are better
Physical function - upper limb (Fugl Meyer Assessment) - Polarity - Higher values are better

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Patient/participantgenerichealth-relatedqualityoflife(StrokeImpactScale-16)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - </= 45 minutes, <5 days a week-t8

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - </= 45 minutes, <5 days a week-t8

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

De Luca, 2018

Bibliographic Reference	De Luca R; Aragona B; Leonardi S; Torrisi M; Galletti B; Galletti F; Accorinti M; Bramanti P; De Cola MC; Calabrò RS; Computerized Training in Poststroke Aphasia: What About the Long-Term Effects? A Randomized Clinical Trial.; Journal of stroke and cerebrovascular diseases : the official journal of National Stroke Association; 2018; vol. 27 (no. 8)

Study details

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

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Italy.
Study setting	Outpatient follow up.
Study dates	January 2014 to April 2016.
Sources of funding	No additional information.
Inclusion criteria	Diagnosis of first ever ischaemic stroke involving the left hemisphere; a moderate-to-severe level of dependence, as evaluated by the Functional Independence Measure; ability to understand simple tasks; token test (TT) at least 5; presence of words auditory comprehension, being the neuropsychological exam for aphasia (NPEA) at least 10
Exclusion criteria	Disabling sensory alterations (i.e. hearing and visual deficit), severe psychiatric and medical illness.
Recruitment / selection of participants	People who attended the Laboratory of Robotic and Behavioural Rehabilitation of the IRCCS Neurolesi "Bonino Pulejo" of Messina.
Intervention(s)	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week N=17 Power-Afa training 24 sessions of 45 minutes each, 3 times a week for 8 week. Commercially available PC program to optimize language recovery and other cognitive functions. The therapist helps and stimulates during each training session, monitoring the number of errors, the execution time and the task accuracy. The tool present phonological, semantic, written and morphological and syntactic tasks.

	Concomitant therapy: Traditional training available to all (standard cognitive rehabilitation for language disorders that was founded on cognitive neuropsychological approach to aphasia). 3 training sessions per week for 8 weeks (24 sessions of 45 minutes each). Included stimulation of phonological abilities, the sementic-lexical and morphosyntactic processes delivered face-to-face.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week N=15 Traditional training only. Concomitant therapy: Traditional training available to all (standard cognitive rehabilitation for language disorders that was founded on cognitive neuropsychological approach to aphasia). 3 training sessions per week for 8 weeks (24 sessions of 45 minutes each). Included stimulation of phonological abilities, the sementic-lexical and morphosyntactic processes delivered face-to-face.
Number of participants	32
Duration of follow-up	8 weeks (end of training), 20 weeks (3 months after end of training)
Indirectness	No additional information.
Elements of the study relating to qualitative themes	People requiring specific consideration: People with communication difficulties

	People with cognitive difficulties Intervention factors: Individual therapy Telerehabilitation, assistive technology and computer-based tools
Additional comments	Method of analysis unclear.

Study arms

Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week (N = 17)
Power-Afa training 24 sessions of 45 minutes each, 3 times a week for 8 week. Commercially available PC program to optimize language recovery and other cognitive functions. The therapist helps and stimulates during each training session, monitoring the number of errors, the execution time and the task accuracy. The tool present phonological, semantic, written and morphological and syntactic tasks. Concomitant therapy: Traditional training available to all (standard cognitive rehabilitation for language disorders that was founded on cognitive neuropsychological approach to aphasia). 3 training sessions per week for 8 weeks (24 sessions of 45 minutes each). Included stimulation of phonological abilities, the sementic-lexical and morphosyntactic processes delivered face-to-face.

Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week (N = 15)
Traditional training only. Concomitant therapy: Traditional training available to all (standard cognitive rehabilitation for language disorders that was founded on cognitive neuropsychological approach to aphasia). 3 training sessions per week for 8 weeks (24 sessions of 45 minutes each). Included stimulation of phonological abilities, the sementic-lexical and morphosyntactic processes delivered face-to-face.

Characteristics

Arm-level characteristics

Characteristic	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week (N = 17)	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week (N = 15)
% Female Sample size	n = 7 ; % = 41.2	n = 7 ; % = 46.7
Mean age (SD) (years) Mean (SD)	52.7 (15.2)	50.5 (14.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	9.5 (3.2)	10.3 (2.5)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 20 week (<6 months)

Continuous outcome

Outcome	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week, Baseline, N = 17	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week, 20 week, N = 17	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week, Baseline, N = 15	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week, 20 week, N = 15
Psychological distress - depression (Aphasic Depression Rating Scale) Scale range: Unclear. Change scores (Least square mean differences). Mean (SD)	18.1 (6.7)	NA (NR)	18.3 (5.95)	NA (NR)
Psychological distress - depression (Aphasic Depression Rating Scale) Scale range: Unclear. Change scores (Least	NA (NA)	4.8 (0.63)	NA (NA)	-0.1 (0.77)

Outcome	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week, Baseline, N = 17	Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week, 20 week, N = 17	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week, Baseline, N = 15	Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week, 20 week, N = 15
square mean differences). Mean (SE)				

Psychological distress - depression (Aphasic Depression Rating Scale) - Polarity - Higher values are better

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

Continuousoutcome-Psychologicaldistress-depression(AphasicDepressionRatingScale)-MeanSE-Speech and language therapy (communication difficulties) - >1 hour to 2 hours, <5 days a week-Speech and language therapy (communication difficulties) - ≤45 minutes, <5 days a week-t20

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

Denes, 1996

Bibliographic Reference	Denes G; Perazzolo C; Piani A; Piccione F; Intensive versus regular speech therapy in global aphasia: a controlled study; Aphasiology; 1996; vol. 10 (no. 4); 385-94

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Italy
Study setting	Mainly outpatient basis
Study dates	No additional information
Sources of funding	Partially supported by a grant of Regione Veneto to G.D.
Inclusion criteria	People with acute global aphasia whose lesion, as documented by CT scan, was restricted to the left hemisphere (ischaemic 17 cases, haemorrhagic 4 cases). All people were right-handed, native speakers of Italian and literates (mean age of schooling 6.5 years).
Exclusion criteria	No additional information

Recruitment / selection of participants	No additional information
Intervention(s)	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week N=8 Intensive speech treatment consisting of an average of 130 individual speech (range 94-160) therapy sessions. Each session lasted between 45 and 60 minutes and sessions were done mostly on an outpatient basis. People were rehabilitated for a mean of 6 months (range 5.2-7 months). The treatment was always given by a trained speech therapist. The approach was 'ecological', trying to restore efficient use of language mainly in a conversational setting. Every means at the patient's disposal (speaking, gesturing, facial expression) was used to stimulate a conversation. Since in conversation it is essential to take turns, the first step was to teach the person the roles of listener and speaker. More attention was given to restoring comprehension than production through conversation setting and usual tests being endowed in a conversation. The approach to production deficit was centred not on retraining the patient at single-word level, but rather engaging the patient in a conversation. This was done, for example, by inviting the patient to retell a short story previously told by the examiner, and relating to their personal experience. Reading and writing were not specifically trained, and were used only in support of restoring oral language and auditory comprehension. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week N=9 Regular speech treatment consisting of an average of 60 individual speech (range 56-70) therapy sessions over a six month period (averaging at 3 sessions weekly). Each session lasted between 45 and 60 minutes and sessions were done mostly on an outpatient basis. People were rehabilitated for a mean of 6 months (range 5.2-7 months). The treatment was

	always given by a trained speech therapist. The approach was 'ecological', trying to restore efficient use of language mainly in a conversational setting. Every means at the patient's disposal (speaking, gesturing, facial expression) was used to stimulate a conversation. Since in conversation it is essential to take turns, the first step was to teach the person the roles of listener and speaker. More attention was given to restoring comprehension than production through conversation setting and usual tests being endowed in a conversation. The approach to production deficit was centred not on retraining the patient at single-word level, but rather engaging the patient in a conversation. This was done, for example, by inviting the patient to retell a short story previously told by the examiner, and relating to their personal experience. Reading and writing were not specifically trained, and were used only in support of restoring oral language and auditory comprehension. Concomitant therapy: No additional information.
Number of participants	17
Duration of follow-up	On average, 6 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	People with communication difficulties Intervention factors Individual therapy Increased opportunities for social stimulation - The intervention is based around conversation

	Environmental factors Hospital care - Outpatient basis
Additional comments	No additional information

Study arms

Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week (N = 8)
Intensive speech treatment consisting of an average of 130 individual speech (range 94-160) therapy sessions. Each session lasted between 45 and 60 minutes and sessions were done mostly on an outpatient basis. People were rehabilitated for a mean of 6 months (range 5.2-7 months). The treatment was always given by a trained speech therapist. The approach was 'ecological', trying to restore efficient use of language mainly in a conversational setting. Every means at the patient's disposal (speaking, gesturing, facial expression) was used to stimulate a conversation. Since in conversation it is essential to take turns, the first step was to teach the person the roles of listener and speaker. More attention was given to restoring comprehension than production through conversation setting and usual tests being endowed in a conversation. The approach to production deficit was centred not on retraining the patient at single-word level, but rather engaging the patient in a conversation. This was done, for example, by inviting the patient to retell a short story previously told by the examiner, and relating to their personal experience. Reading and writing were not specifically trained, and were used only in support of restoring oral language and auditory comprehension. Concomitant therapy: No additional information.

Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week (N = 9)
Regular speech treatment consisting of an average of 60 individual speech (range 56-70) therapy sessions over a six month period (averaging at 3 sessions weekly). Each session lasted between 45 and 60 minutes and sessions were done mostly on an outpatient basis. People were rehabilitated for a mean of 6 months (range 5.2-7 months). The treatment was always given by a trained speech therapist. The approach was 'ecological', trying to restore efficient use of language mainly in a conversational setting. Every means at

the patient's disposal (speaking, gesturing, facial expression) was used to stimulate a conversation. Since in conversation it is essential to take turns, the first step was to teach the person the roles of listener and speaker. More attention was given to restoring comprehension than production through conversation setting and usual tests being endowed in a conversation. The approach to production deficit was centred not on retraining the patient at single-word level, but rather engaging the patient in a conversation. This was done, for example, by inviting the patient to retell a short story previously told by the examiner, and relating to their personal experience. Reading and writing were not specifically trained, and were used only in support of restoring oral language and auditory comprehension. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	**Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week (N = 8)**	**Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week (N = 9)**
% Female Sample size	n = 3 ; % = 38	n = 6 ; % = 67
Mean age (SD) (years) Mean (SD)	58.1 (11.8)	62.1 (8.7)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week (N = 8)	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week (N = 9)
Time period since stroke (Months) Mean (SD)	3.2 (1.8)	3 (1.6)
Type of communication difficulty All had aphasia Sample size	n = 8 ; % = 100	n = 9 ; % = 100

Outcomes

Study timepoints

- Baseline
- 6 month (≥6 months)

Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week compared to Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week at ≥6 months - continuous outcomes

Outcome	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 8	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 8	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 9	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, 6 month, N = 9
Communication - naming (Aachan Aphasia Test Naming)	34 (5.7)	10.2 (9.9)	31.4 (3.1)	4.5 (4.2)

Outcome	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 8	Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 8	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 9	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, 6 month, N = 9
Scale range: Unclear. Change scores. Mean (SD)				
Communication - auditory comprehension (Aachan Aphasia Test, Token Test) Scale range: Unclear. Change scores. Mean (SD)	32.6 (10)	11.4 (11.6)	32.2 (9.8)	5.2 (7.8)

Communication - naming (Aachan Aphasia Test Naming) - Polarity - Higher values are better
Communication - auditory comprehension (Aachan Aphasia Test, Token Test) - Polarity - Higher values are better

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

SpeechandLanguageTherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguageTherapy->45minutesto1hour,<5daysaweekat≥6months-continuousoutcomes-Communication-naming(AachanAphasiaTestNaming)-MeanSD-Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week-t6

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

SpeechandLanguageTherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguageTherapy->45minutesto1hour,<5daysaweekat≥6months-continuousoutcomes-Communication-auditorycomprehension(AachanAphasiaTest,TokenTest)-MeanSD-Speech and Language Therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week-t6

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

Di Lauro, 2003

Bibliographic Reference	Di Lauro, A.; Pellegrino, L.; Savastano, G.; Ferraro, C.; Fusco, M.; Balzarano, F.; Franco, M. M.; Biancardi, L. G.; Grasso, A.; A randomized trial on the efficacy of intensive rehabilitation in the acute phase of ischemic stroke; Journal of Neurology; 2003; vol. 250 (no. 10); 1206-8

Study details

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

Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Italy
Study setting	Hospital inpatient
Study dates	NR
Sources of funding	NR
Inclusion criteria	Inclusion criteria were: hemiplegia caused by hemispherical ischemic lesion (detected by computerized tomography of the skull), unimpaired consciousness, disability due to the stroke of such a severity as to make impossible daily living activities (Barthel-Index ≤ 3)
Exclusion criteria	Exclusion criteria were: cerebral hemorrhage, hemineglect, disabilities that were not of the hemiplegic type, slight hemiparesis, concomitant sensorial aphasia, severe concomitant cardiac or respiratory disorders, signs that were the outcome of a previous cerebrovascular disorder
Recruitment / selection of participants	Sixty patients were enrolled in the present study. They were of both sexes and were between 40 and 80 years old. All gave their informed consent prior to their inclusion in the study
Intervention(s)	Intensive rehabilitative treatment. Duration: 2 hours a day with an interval of 6 hours between the morning and the afternoon treatment.

	Morning treatment – exercises of mobilization according to the scheme of Knott & Voss [6], with “active” work (against resistance on the part of the therapist) for about 45 minutes; – exercises of proprioceptive recognition; – rehabilitative nursing (correct positioning in bed, bedsores prevention, intermittent bladder catheterisation) for 15 minutes. Afternoon treatment – exercises of mobilization for about 15 minutes; – tactile, kinesthetic and proprioceptive stimulation; – exercises of visual stimulation (light sources that vary in intensity, such as television screen and stroboscopic light); – cognitive skill exercises; – exercises of acoustic stimulation (using a tape-recorder for 45 minutes).
Population subgroups	NR
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Ordinary rehabilitative treatment Duration: 45 minutes, once a day. Contents: passive and active (if possible) mobilization, bedsores prevention, correct positioning in bed.
Number of participants	60
Duration of follow-up	14 days and 180 days
Indirectness	NR
Elements of the study relating to qualitative themes	intensity tailored to the individual Intervention factors: Individual Environment factors: Hospital care
Additional comments	NR

Study arms

Physiotherapy - >1-2 hours, 5 days a week (N = 29)
Intensive rehabilitative treatment. Duration: 2 hours a day with an interval of 6 hours between the morning and the afternoon treatment.

Physiotherapy - </= 45 minutes, 5 days a week (N = 31)
Ordinary rehabilitative treatment. Duration: 45 minutes, once a day.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 60)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	Physiotherapy - >1-2 hours, 5 days a week (N = 29)	Physiotherapy - </= 45 minutes, 5 days a week (N = 31)
% Female No of events	n = 18	*empty data*
% Female Mean (SD)	18 (*empty data*)	17 (*empty data*)
Mean age (SD) Mean (SD)	69.3 (8)	67.6 (9.3)
Severity Mean (SD)	10.8 (2.8)	10.6 (2.4)

Outcomes

Study timepoints

- Baseline
- 16 day
- 180 day

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 29	Physiotherapy - >1-2 hours, 5 days a week, 16 day, N = 26	Physiotherapy - >1-2 hours, 5 days a week, 180 day, N = 22	Physiotherapy - </= 45 minutes, 5 days a week, Baseline, N = 31	Physiotherapy - </= 45 minutes, 5 days a week, 16 day, N = 27	Physiotherapy - </= 45 minutes, 5 days a week, 180 day, N = 24
Activities of dialy living (Barthel index) Mean (SD)	1.4 (1.4)	3.2 (2)	8 (2.8)	1.5 (1.5)	3.2 (2.6)	7.7 (3)

Activities of dialy living (Barthel index) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 29	Physiotherapy - >1-2 hours, 5 days a week, 16 day, N = 29	Physiotherapy - >1-2 hours, 5 days a week, 180 day, N = 29	Physiotherapy - </= 45 minutes, 5 days a week, Baseline, N = 31	Physiotherapy - </= 45 minutes, 5 days a week, 16 day, N = 31	Physiotherapy - </= 45 minutes, 5 days a week, 180 day, N = 31
Discontinutation from study No of events	n = 0 ; % = 0	n = 3 ; % = 10.3	n = 7 ; % = 24.1	n = 0 ; % = 0	n = 2 ; % = 6.9	n = 7 ; % = 24.1

Discontinutation from study - Polarity - Lower values are better

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

Continuousoutcomes-Activitiesofdialyliving(Barthelindex)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - </= 45 minutes, 5 days a week-t16

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to randomization and missing date)*
Overall bias and Directness	Overall Directness	Directly applicable

Continuousoutcomes-Activitiesofdialyliving(Barthelindex)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - </= 45 minutes, 5 days a week-t180

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to randomization and missing date)*
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Discontinutationfromstudy-NoOfEvents-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - </= 45 minutes, 5 days a week-t16

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to randomization and missing date)*
Overall bias and Directness	Overall Directness	Directly applicable

Dichotomousoutcomes-Discontinutationfromstudy-NoOfEvents-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - </= 45 minutes, 5 days a week-t180

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due to randomization and missing date)*
Overall bias and Directness	Overall Directness	Directly applicable

Donaldson, 2009

Bibliographic Reference	Donaldson, C.; Tallis, R.; Miller, S.; Sunderland, A.; Lemon, R.; Pomeroy, V.; Effects of conventional physical therapy and functional strength training on upper limb motor recovery after stroke: a randomized phase II study; Neurorehabilitation & Neural Repair; 2009; vol. 23 (no. 4); 389-97

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	Delivered in clinical centers
Study dates	No additional information
Sources of funding	Funding provided by the Wellcome Trust
Inclusion criteria	Infarction of the anterior cerebral circulation (diagnosed through neuroimaging) between 1 week and 3 months after stroke; some voluntary muscle activity in the paretic upper limb, scoring 4+/57 on the ARAT but unable to complete the Nine Hole Peg Test (9HPT) in 50 seconds or less; able, prior to their stroke, to use the paretic upper limb to lift a cup and drink from it; able to follow a one-stage command ("touch your nose with your stronger hand"): able to participate in routine therapy
Exclusion criteria	Unilateral visuospatial neglect on clinical observation of subject's ability to orientate toward objects and people in their environment
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, <5 days a week N=20 A combination of conventional therapy with either additional conventional therapy (n=10) or functional strength training (n=10). This was delivered by the research physiotherapist. The functional strength training gave prominence to: directing the subject's attention to the exercise activity being performed, appropriate verbal feedback on performance, repetitions and goal-directed functional activity (therapist hands-off). Functional strength training was based on the key elements of normal upper limb function, that is, on positioning the hand and then using it to manipulate objects. The focus was on improving the power of shoulder/elbow muscles to enable appropriate placing of the hand improving the production of appropriate force in different muscles to achieve the specific task; and on specific interventions for the wrist and finger muscles to maximize

	ability to manipulate objects. The initial level of resistance was the maximum load that still permitted 5 repetitions of movement/action through the available range of muscle length. Treatment was progressed using repetition, altering the size and weight of items, and using heavier weights. The intervention was provided for up to 1 hour, 4 days a week for 6 weeks. Concomitant therapy: All received conventional physical therapy delivered by clinical physiotherapists in each clinical centre using a standardized treatment schedule generated using established methods. The format was similar to that produced for the lower limb and the content included soft tissue mobilisation, facilitation of muscle activity/movement, positioning, and education for patient/carer. The treatment schedule emphasized interventions provided by the therapist facilitating and guiding movement to provide sensory input to optimize joint alignment in preparation for voluntary movement.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </= 45 minutes, <5 days a week N=10 Conventional therapy only for an uncertain time (2.81 hours in total, so possibly 30 minutes once a week?). Concomitant therapy: All received conventional physical therapy delivered by clinical physiotherapists in each clinical centre using a standardized treatment schedule generated using established methods. The format was similar to that produced for the lower limb and the content included soft tissue mobilisation, facilitation of muscle activity/movement, positioning, and education for patient/carer. The treatment schedule emphasized interventions provided by the therapist facilitating and guiding movement to provide sensory input to optimize joint alignment in preparation for voluntary movement.
Number of participants	30

Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Environmental factors: Hospital care
Additional comments	Intention to treat analysis

Study arms

Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 20)
A combination of conventional therapy with either additional conventional therapy (n=10) or functional strength training (n=10). This was delivered by the research physiotherapist. The functional strength training gave prominence to: directing the subject's attention to the exercise activity being performed, appropriate verbal feedback on performance, repetitions and goal-directed functional activity (therapist hands-off). Functional strength training was based on the key elements of normal upper limb function, that is, on positioning the hand and then using it to manipulate objects. The focus was on improving the power of shoulder/elbow muscles to enable appropriate placing of the hand improving the production of appropriate force in different muscles to achieve the specific task; and on specific interventions for the wrist and finger muscles to maximize ability to manipulate objects. The initial level of resistance was the maximum load that still permitted 5 repetitions of movement/action through the available range of muscle length. Treatment was progressed using repetition, altering the size and weight of items, and using heavier weights. The intervention was provided for up to 1 hour, 4 days a week for 6 weeks. Concomitant therapy: All received conventional physical therapy delivered by clinical

physiotherapists in each clinical centre using a standardized treatment schedule generated using established methods. The format was similar to that produced for the lower limb and the content included soft tissue mobilisation, facilitation of muscle activity/movement, positioning, and education for patient/carer. The treatment schedule emphasized interventions provided by the therapist facilitating and guiding movement to provide sensory input to optimize joint alignment in preparation for voluntary movement.

Physiotherapy - </= 45 minutes, <5 days a week (N = 10)
Conventional therapy only for a time not specified in the paper. Concomitant therapy: All received conventional physical therapy delivered by clinical physiotherapists in each clinical centre using a standardized treatment schedule generated using established methods. The format was similar to that produced for the lower limb and the content included soft tissue mobilisation, facilitation of muscle activity/movement, positioning, and education for patient/carer. The treatment schedule emphasized interventions provided by the therapist facilitating and guiding movement to provide sensory input to optimize joint alignment in preparation for voluntary movement.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 20)**	**Physiotherapy - </= 45 minutes, <5 days a week (N = 10)**
% Female Sample size	n = 12 ; % = 55	n = 5 ; % = 50
Mean age (SD) (years) Range	43 to 89	44 to 90
Mean age (SD) (years) Mean (SD)	72.9 (NR)	72.6 (NR)

Characteristic	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 20)	Physiotherapy - </= 45 minutes, <5 days a week (N = 10)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Range	7 to 61	8 to 22
Time period since stroke (days) Mean (SD)	23.5 (NR)	13.4 (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, <5 days a week compared to Physiotherapy - </= 45 minutes, <5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 6 week, N = 20	Physiotherapy - </= 45 minutes, <5 days a week, Baseline, N = 8	Physiotherapy - </= 45 minutes, <5 days a week, 6 week, N = 8
Physical function - upper limb (Action Research Arm Test) Scale range: 0-57. Final values. Mean (SD)	29.85 (13.54)	42.7 (18.39)	30.5 (13.07)	45 (13.93)

Physical function - upper limb (Action Research Arm Test) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, <5 days a week compared to Physiotherapy - </= 45 minutes, <5 days a week at <6 months - dichotomous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 6 week, N = 20	Physiotherapy - </= 45 minutes, <5 days a week, Baseline, N = 10	Physiotherapy - </= 45 minutes, <5 days a week, 6 week, N = 10
Discontinuation CPT+FST = 1 unwell, 1 abroad. CPT+CPT = 1 unwell, 2 died, 1 moved home. Control: 3 unwell, 1 abroad, 1 bail. No of events	n = NA ; % = NA	n = 6 ; % = 30	n = NA ; % = NA	n = 5 ; % = 50

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,<5daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(ActionResearchArmTest)-MeanSD-Physiotherapy - >45 minutes to 1 hour, <5 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t6

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

Physiotherapy->45minutesto1hour,<5daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, <5 days a week-Physiotherapy - </= 45 minutes, <5 days a week-t6

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

English, 2015

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

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	English, C.; Bernhardt, J.; Hillier, S.; Circuit class therapy and 7-day-week therapy increase physiotherapy time, but not patient activity: early results from the CIRCIT trial; Stroke; 2014; vol. 45 (no. 10); 3002-7
Trial name / registration number	ACTRN12610000096055
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	People recruited from one of five stroke rehabilitation centres 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)	Physiotherapy - >1 to 2 hours, 5 days a week N=93 Circuit class therapy for up to 3 hours per day, usually in two 90 minute sessions morning and afternoon. Circuit class therapy involved groups of at least three (and up to six) participants and was staffed by physiotherapists, assistants and physiotherapy students with no more than one staff member to three participants. Where there were less than three participants randomised to the circuit class arm of the trial at any given time, non-trial patients with mobility issues were included in circuit class therapy sessions. Training of trial staff included a half-day workshop conducted at each recruitment site before commencement of the trial. Circuit class therapy sessions were not run according to a strict protocol. Training was intended to guide therapists in how to best adapt their usual practices to the setting. Therapists were encouraged to prescribe exercises and activities that were task-specific, included part- as well as whole-practice of tasks, with an emphasis on repetition and feedback. Circuit class therapy was provided within existing staffing levels at all sites. 5 days a week for 4 weeks. Concomitant therapy: No additional information. Physiotherapy - </=45 minutes, 7 days a week N=96 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. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb Mobility
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=94 Usual care dependent on the site provided for 5 days a week. This was done with daily individual therapy and augmented for some people by group physiotherapy 1-4 times a week. Concomitant therapy: No additional information.

Number of participants	283
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Group-based therapy vs. individual therapy 7 day working Environmental factors: Hospital care Service factors: Seven day working - Required additional staff Staffing levels and deployment - Additional staff are required for seven day working, group based therapy could be delivered within the staffing levels available
Additional comments	Unclear method of analysis

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 93)
Circuit class therapy for up to 3 hours per day, usually in two 90 minute sessions morning and afternoon. Circuit class therapy involved groups of at least three (and up to six) participants and was staffed by physiotherapists, assistants and physiotherapy students with no more than one staff member to three participants. Where there were less than three participants randomised to the circuit class arm of the trial at any given time, non-trial patients with mobility issues were included in circuit class therapy sessions. Training of trial staff included a half-day workshop conducted at each recruitment site before commencement of the trial. Circuit class therapy sessions were not run according to a strict protocol. Training was intended to guide therapists in how to best adapt their usual practices to the setting. Therapists were encouraged to prescribe exercises and activities that were task-specific, included part- as well as whole-practice of tasks, with an emphasis on repetition and feedback. Circuit class therapy was provided within existing staffing levels at all sites. 5 days a week for 4 weeks. Concomitant therapy: No additional information.

Physiotherapy - </=45 minutes, 7 days a week (N = 96)
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. Concomitant therapy: No additional information.

Physiotherapy - </=45 minutes, 5 days a week (N = 94)
Usual care dependent on the site provided for 5 days a week. This was done with daily individual therapy and augmented for some people by group physiotherapy 1-4 times a week. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 93)	Physiotherapy - </=45 minutes, 7 days a week (N = 96)	Physiotherapy - </=45 minutes, 5 days a week (N = 94)
% Female	n = 37 ; % = 39.8	n = 37 ; % = 38.5	n = 42 ; % = 44.7

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 93)	Physiotherapy - </=45 minutes, 7 days a week (N = 96)	Physiotherapy - </=45 minutes, 5 days a week (N = 94)
Sample size			
Mean age (SD) (years) Mean (SD)	70 (12.9)	71.9 (12)	68.2 (13.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	30.9 (28.2)	25 (17.2)	28.7 (17.4)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline

- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - </=45 minutes, 7 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 93	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 93	Physiotherapy - </=45 minutes, 7 days a week, Baseline, N = 96	Physiotherapy - </=45 minutes, 7 days a week, 4 week, N = 96	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 94	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 94
Discontinuation Circuit training: 2 withdrew, 7 unable/unwilling to attend assessment appointment. 7 day = 2 withdrew, 7 unable/unwilling to attend assessment appointment. Control: 1 withdrew, 5 unable/unwilling to attend assessment appointment. No of events	n = NA ; % = NA	n = 9 ; % = 9.7	n = NA ; % = NA	n = 9 ; % = 9.4	n = NA ; % = NA	n = 6 ; % = 6.4

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,7daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 7 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

English, 2014

Bibliographic Reference	English, C.; Bernhardt, J.; Hillier, S.; Circuit class therapy and 7-day-week therapy increase physiotherapy time, but not patient activity: early results from the CIRCIT trial; Stroke; 2014; vol. 45 (no. 10); 3002-7

Study details

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

Fasoli, 2004

Bibliographic Reference	Fasoli, S. E.; Krebs, H. I.; Ferraro, M.; Hogan, N.; Volpe, B. T.; Does shorter rehabilitation limit potential recovery poststroke?; Neurorehabilitation & Neural Repair; 2004; vol. 18 (no. 2); 88-94

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United States of America
Study setting	Inpatient rehabilitation stroke unit
Study dates	Between 1996 and 1999.
Sources of funding	This work was supported by grants from the National Institute of Child Health and Human Development of the National Institute of Health (NIH), #R01-HD-36827, #R01 HD37397; the Burke Medical Research Institute, and the Langeloth

	Foundation. S. E. Fasoli was supported, in part, by a National Research Service Award from the National Institute of Child Health and Human Development of NIH, grant F32 HD41795.
Inclusion criteria	People after a single, unilateral stroke; all people needed to be able to follow simple instructions during therapy
Exclusion criteria	No additional information (sensory or visual field impairment, aphasia and impaired cognition were not exclusion criteria)
Recruitment / selection of participants	People who volunteered after being admitted to the inpatient rehabilitation stroke unit
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=30 Robot therapy for five 1 hour sessions per week, participating in at least 25 sessions of sensorimotor robotic training for the paretic arm. People were asked to perform goal-directed, planar reaching tasks that emphasized shoulder and elbow movements. When the person was unable to reach, the robot provided movement assistance. Robot therapy was delivered with MIT-MANUS. Concomitant therapy: All people also received conventional, interdisciplinary rehabilitation services.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, <5 days a week N=26 Robot exposure for one 1 hour session per week. Robot therapy was delivered with MIT-MANUS.

	Concomitant therapy: All people also received conventional, interdisciplinary rehabilitation services.
Number of participants	56
Duration of follow-up	End of intervention (at discharge - on average 3.5 weeks).
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors: Hospital care Use of expensive equipment
Additional comments	No additional information about method of analysis (appears to include all participants)

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 30)
Robot therapy for five 1 hour sessions per week, participating in at least 25 sessions of sensorimotor robotic training for the paretic arm. People were asked to perform goal-directed, planar reaching tasks that emphasized shoulder and elbow movements. When the person was unable to reach, the robot provided movement assistance. Robot therapy was delivered with MIT-MANUS. Concomitant therapy: All people also received conventional, interdisciplinary rehabilitation services.

Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 26)
Robot exposure for one 1 hour session per week. Robot therapy was delivered with MIT-MANUS. Concomitant therapy: All people also received conventional, interdisciplinary rehabilitation services.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 30)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 26)
% Female Sample size	n = 14 ; % = 47	n = 12 ; % = 46
Mean age (SD) (years) Mean (SD)	62 (2.4)	67 (2.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 30)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 26)
Sample size		
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	14 (0.9)	16 (1.3)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3.5 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 30	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 3.5 week, N = 30	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 26	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 3.5 week, N = 26
Physical function - upper limb (Fugl-Meyer test) Scale range: 0-66. Final values. Mean (SE)	8.6 (1.6)	15.7 (2)	10.5 (2.6)	16.3 (3.1)
Activities of daily living (functional independence measure) Scale range: Motor subscale: paper states maximum: 77, Cognition subscale: 5-35 (paper states maximum: 35). Self-care subscale unclear (paper states maximum 42, but not generally reported as a part of the FIM. Normally the motor scale would be larger, so possibly this includes some components from that and may double report?) Mean (SE)	NR (NR)	NR (NR)	NR (NR)	NR (NR)
FIM Upper Limb Self-Care Mean (SE)	19.6 (0.8)	29.9 (1.2)	16.3 (1.1)	25 (1.5)
FIM Motor Upper and Lower Limbs Mean (SE)	30 (1.3)	53.5 (1.8)	25.1 (1.7)	44.6 (2.6)
FIM Cognitive Mean (SE)	24.9 (1.1)	30.4 (0.8)	17.3 (1.5)	23.2 (1.2)

Physical function - upper limb (Fugl-Meyer test) - Polarity - Higher values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Physicalfunction-upperlimb(Fugl-Meyertest)-MeanSE-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t3.5

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Activitiesofdailyliving(functionalindependencemeasure)-FIMUpperLimbSelf-Care-MeanSE-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t3.5

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Activitiesofdailyliving(functionalindependencemeasure)-FIMMotorUpperandLowerLimbs-MeanSE-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t3.5

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Activitiesofdailyliving(functionalindependencemeasure)-FIMCognitive-MeanSE-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t3.5

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

Galvin, 2011

Bibliographic Reference	Galvin, R.; Cusack, T.; O'Grady, E.; Murphy, T. B.; Stokes, E.; Family-mediated exercise intervention (FAME): evaluation of a novel form of exercise delivery after stroke; Stroke; a journal of cerebral circulation; 2011; vol. 42 (no. 3); 681-686

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	NCT 00666744
Study type	Randomised controlled trial (RCT)
Study location	Ireland
Study setting	Inpatient or outpatient setting
Study dates	August 2007 to January 2009.
Sources of funding	Supported by a grant from the Irish Heart Foundation in association with the Medical Research Charities Group. The project also received funding from the Friends of the Royal Hospital Donnybrook, the O'Driscoll/O'Neil bursary in conjunction with the Irish Society of Chartered Physiotherapists (2006) and the Seed Funding Scheme in University College Dublin.
Inclusion criteria	Confirmed diagnosis of a first unilateral stroke (MRI or CT); at least 18 years of age; participating in a physiotherapy program; a family member willing to participate in the program (they were considered eligible if they were willing to participate and nominated by the stroke survivor as the person that they would most like to assist them in the performance of the exercises).
Exclusion criteria	Impairment of cognition (<24 of 30 on the Mini Mental State Examination)

Recruitment / selection of participants	People were identified from each hospital's stroke register.
Intervention(s)	Physiotherapy - </=45 minutes, 5 days a week N=20 Family-mediated exercise intervention conducted for 35 minutes daily at the bedside with the assistance of their nominated family member. Delivered in hospital or at home. Each program involved training the family member with the skills necessary to carry out the additional exercises. If they were unable to complete the exercises, a second family member attended the session for that week. Treatment goals were set weekly after feedback from the treating physiotherapist, the individual with stroke and their family member. Exercises were designed according to the participants' ability and were progressed accordingly. The emphasis of the program was on achieving stability and improving gait velocity and lower limb strength. Concomitant therapy: Routine physiotherapy was provided to all participants (delivered by physiotherapy staff not linked to the project as inpatients in an acute hospital or rehabilitation unit, and outpatients if they were discharged before the end of the trial).
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Mixed

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Usual care N=20 Usual rehabilitation (no information about how much time this equated to.

	Concomitant therapy: Routine physiotherapy was provided to all participants (delivered by physiotherapy staff not linked to the project as inpatients in an acute hospital or rehabilitation unit, and outpatients if they were discharged before the end of the trial).
Number of participants	40
Duration of follow-up	8 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - The exercises were designed dependent on the needs of the person Carer/family member factors: Support from family and friends Continuity of care - Family members involved in ensuring the intervention can take place Intervention factors: Individual therapy 'Homework'/self management interventions

	Level of person centred care - Exercises developed dependent on the needs of the person Need for technical support and training - Need to train the family member to ensure the intervention is completed adequately Goal setting - Goal setting was used to help design the exercises Environmental factors: Hospital care or Home Supervision - by a family member
Additional comments	Intention to treat - last observation carried forward

Study arms

Physiotherapy - </=45 minutes, 5 days a week (N = 20)
Family-mediated exercise intervention conducted for 35 minutes daily at the bedside with the assistance of their nominated family member. Delivered in hospital or at home. Each program involved training the family member with the skills necessary to carry out the additional exercises. If they were unable to complete the exercises, a second family member attended the session for that week. Treatment goals were set weekly after feedback from the treating physiotherapist, the individual with stroke and their family member. Exercises were designed according to the participants' ability and were progressed accordingly. The emphasis of the program was on achieving stability and improving gait velocity and lower limb strength. Concomitant therapy: Routine physiotherapy was provided to all participants (delivered by physiotherapy staff not linked to the project as inpatients in an acute hospital or rehabilitation unit, and outpatients if they were discharged before the end of the trial).

Usual care (N = 20)
Usual rehabilitation (no information about how much time this equated to. Concomitant therapy: Routine physiotherapy was provided to all participants (delivered by physiotherapy staff not linked to the project as inpatients in an acute hospital or rehabilitation unit, and outpatients if they were discharged before the end of the trial).

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - </=45 minutes, 5 days a week (N = 20)	Usual care (N = 20)
% Female Sample size	n = 7 ; % = 35	n = 13 ; % = 65
Mean age (SD) (years) Mean (SD)	63.15 (13.3)	69.95 (11.69)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	18.9 (2.9)	19.7 (3)

Characteristic	Physiotherapy - </=45 minutes, 5 days a week (N = 20)	Usual care (N = 20)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Physiotherapy - </=45 minutes, 5 days a week compared to Usual care at <6 months - continuous outcomes

Outcome	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 20	Physiotherapy - </=45 minutes, 5 days a week, 8 week, N = 20	Usual care, Baseline, N = 20	Usual care, 8 week, N = 20
Activities of daily living (barthel index) Scale range: 0-100. Change scores. Mean (SD)	56.3 (27)	32.3 (24)	65.5 (27.9)	16.3 (14.2)
Physical function - lower limb (Fugl Meyer Assessment) Scale range: 0-34. Change scores. Mean (SD)	21.1 (11.3)	9.5 (9.9)	25.7 (11.9)	1.75 (6.3)

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

Physical function - lower limb (Fugl Meyer Assessment) - Polarity - Higher values are better

Physiotherapy - </=45 minutes, 5 days a week compared to Usual care at <6 months - dichotomous outcome

Outcome	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 20	Physiotherapy - </=45 minutes, 5 days a week, 8 week, N = 20	Usual care, Baseline, N = 20	Usual care, 8 week, N = 20
Discontinuation Did not receive intervention (due to MI or second stroke) = 2. Control: Did not receive intervention (medically unwell) = 1, death = 2. No of events	n = NA ; % = NA	n = 2 ; % = 10	n = NA ; % = NA	n = 3 ; % = 15

Discontinuation - Polarity - Lower values are better

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

Physiotherapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - </=45 minutes, 5 days a week-Usual care-t8

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

Physiotherapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-continuousoutcomes-Physicalfunction-lowerlimb(FuglMeyerAssessment)-MeanSD-Physiotherapy - </=45 minutes, 5 days a week-Usual care-t8

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

Physiotherapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - </=45 minutes, 5 days a week-Usual care-t8

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

Gilbertson, 2000

Bibliographic Reference	Gilbertson, L.; Langhorne, P.; Walker, A.; Allen, A.; Murray, G. D.; Domiciliary occupational therapy for patients with stroke discharged from hospital: randomised controlled trial; BMJ; 2000; vol. 320 (no. 7235); 603-6

Study details

Secondary publication of another included	No additional information

study- see primary study for details	
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	Home based with people admitted to a Glasgow royal infirmary NHS trust practice (two hospital sites within a UK teaching hospital)
Study dates	No additional information
Sources of funding	Chest Heart and Stroke Scotland provided the funding for this study. Additional support came from Glasgow Royal Infirmary NHS Trust and the chief scientists office, Scottish Office, which funded a research training fellowship for LG.
Inclusion criteria	People with a clinical diagnosis of stroke (excluding subarachnoid haemorrhage) who were admitted to a Glasgow royal infirmary NHS trust if they had been referred to the occupational therapy department and if a discharge date had yet to be set.
Exclusion criteria	People for whom the service may be inappropriate (full recovery, discharge to institutional care, terminal illness); those living outside the hospital area; those unable to take part in the trial (severe cognitive or communication problems preventing consent, completion of outcome measures, or the agreement of simple goals for recovery).
Recruitment / selection of participants	People at hospitals in the trust who were referred for occupational therapy before discharge

Intervention(s)	Occupational therapy - </=45 minutes, <5 days a week N=67 Domiciliary care designed to be client centred and developed through focus group sessions with patients, carers, and local occupational therapy staff. From this a six week domiciliary programme was developed (comprising around 10 visits lasting 30-45 minutes) tailored to recovery goals identified by the patient such as regaining self care or domestic or leisure activities. The therapist worked with the patient to achieve these goals and also liaised with other agencies for advice, services and equipment. Concomitant therapy: Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Usual care N=71 Routine services only. Concomitant therapy: Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital.
Number of participants	138

Duration of follow-up	8 weeks (end of intervention) and 6 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy 'Homework'/self management interventions Goal setting Environmental factors: Home
Additional comments	Intention to treat

Study arms

Occupational therapy - </=45 minutes, <5 days a week (N = 67)
Domiciliary care designed to be client centred and developed through focus group sessions with patients, carers, and local occupational therapy staff. From this a six week domiciliary programme was developed (comprising around 10 visits lasting 30-45 minutes) tailored to recovery goals identified by the patient such as regaining self care or domestic or leisure activities. The therapist worked with the patient to achieve these goals and also liaised with other agencies for advice, services and equipment. Concomitant

therapy: Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital.

Usual care (N = 71)
Routine services only. Concomitant therapy: Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital.

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - </=45 minutes, <5 days a week (N = 67)**	**Usual care (N = 71)**
% Female Sample size	n = 38 ; % = 57	n = 40 ; % = 66
Mean age (SD) (years) Median (IQR)	71 (28 to 89)	71 (31 to 89)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Occupational therapy - </=45 minutes, <5 days a week (N = 67)	Usual care (N = 71)
Severity Rankin score before stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
0-2 Sample size	n = 62 ; % = 93	n = 66 ; % = 93
3-4 Sample size	n = 5 ; % = 7	n = 5 ; % = 7
Time period since stroke (days) Median (IQR)	31 (17 to 57)	23 (13 to 66)
Type of communication difficulty Total with dysphasia Sample size	n = 22 ; % = 33	n = 16 ; % = 22

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)
- 6 month (≥6 months)

Occupational therapy - </=45 minutes, <5 days a week compared to Usual care at <6 months and ≥6 months - dichotomous outcome

Outcome	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 67	Occupational therapy - </=45 minutes, <5 days a week, 8 week, N = 67	Occupational therapy - </=45 minutes, <5 days a week, 6 month, N = 67	Usual care, Baseline, N = 71	Usual care, 8 week, N = 71	Usual care, 6 month, N = 71
Discontinuation At <6 months: Intervention = 2 dead, 1 unable to complete assessments. Control: 1 dead, 1 unable to complete assessments. ≥6 months: Intervention = 6 dead, 1 unable to complete assessments. Control: 5 dead, 3 unable to complete assessments. No of events	n = NA ; % = NA	n = 3 ; % = 4.5	n = 7 ; % = 10.4	n = NA ; % = NA	n = 2 ; % = 2.8	n = 8 ; % = 11.3

Discontinuation - Polarity - Lower values are better

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

Occupationaltherapy-</=45minutes,<5daysaweekcomparedtoUsualcareat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - </=45 minutes, <5 days a week-Usual care-t8

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

Gjellesvik, 2020

Bibliographic Reference	Gjellesvik, T. I.; Becker, F.; Tjonna, A. E.; Indredavik, B.; Nilsen, H.; Brurok, B.; Torhaug, T.; Busuladzic, M.; Lydersen, S.; Askim, T.; Effects of High-Intensity Interval Training After Stroke (the HIIT-Stroke Study): A Multicenter Randomized Controlled Trial; Archives of Physical Medicine & Rehabilitation; 2020; vol. 101 (no. 6); 939-947

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	Norway
Study setting	Specialised rehabilitation units at three hospitals in Norway
Study dates	September 2015 to December 2017
Sources of funding	No additional information

Inclusion criteria	First-ever stroke (ischaemic or haemorrhagic) verified with CT/MR; willing and able to give informed consent; independent walking with or without an assistive device; minimum three months and maximum five years post-stroke; living in the community and able to travel to the assessment and training site; approval to participate from the study's responsible medical doctor and a score on the modified Rankin Scale of 0-3.
Exclusion criteria	Instability of cardiac conditions (e.g. serious rhythm disorder or valve malfunction); poorly controlled hypertension (>180/100) measured at rest; any other medical condition where the test of VO2peak was contraindicated; subarachnoid haemorrhage or participation in another ongoing intervention study.
Recruitment / selection of participants	People on patient lists at each hospital and were contacted with information about the study from the study coordinator at each hospital.
Intervention(s)	Physiotherapy - </=45 minutes, <5 days a week N=36 High intensity interval training in addition to standard care provided 3 days a week. Each session started with a 10-minute warm-up period when the treadmill speed and/or inclination was gradually increased to reach target training intensity. After the warm-up period, the protocol comprised 4-minute intervals at 85%-95% of peak heart rate interspersed with 3 minutes of active breaks at 50-70% at peak heart rate. Total exercise time was 38 minutes each session for 8 weeks (3 sessions per week). Conventional therapy: Activities with moderate to high intensity 3-5 days per week.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Usual care N=34 Standard care.

	Conventional therapy: Activities with moderate to high intensity 3-5 days per week.
Number of participants	70
Duration of follow-up	12 months (end of intervention = 8 weeks)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Travel time - People had to be able to travel to the study centre Environmental factors: Home
Additional comments	Intention to treat

Study arms

Physiotherapy - </=45 minutes, <5 days a week (N = 36)
High intensity interval training in addition to standard care provided 3 days a week. Each session started with a 10-minute warm-up period when the treadmill speed and/or inclination was gradually increased to reach target training intensity. After the warm-up period, the protocol comprised 4-minute intervals at 85%-95% of peak heart rate interspersed with 3 minutes of active breaks at 50-70% at peak heart rate. Total exercise time was 38 minutes. Conventional therapy: Activities with moderate to high intensity 3-5 days per week.

Usual care (N = 34)
Standard care. Conventional therapy: Activities with moderate to high intensity 3-5 days per week.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - </=45 minutes, <5 days a week (N = 36)	Usual care (N = 34)
% Female Sample size	n = 15 ; % = 41.7	n = 20 ; % = 41.2
Mean age (SD) (years) Mean (SD)	57.6 (9.2)	58.7 (9.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - </=45 minutes, <5 days a week (N = 36)	Usual care (N = 34)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	25.4 (14.5)	27.4 (14.7)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)
- 12 month (≥6 months)

Physiotherapy - </=45 minutes, <5 days a week compared to Usual care at <6 months and ≥6 months - dichotomous outcome

Outcome	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 36	Physiotherapy - </=45 minutes, <5 days a week, 8 week, N = 36	Physiotherapy - </=45 minutes, <5 days a week, 12 month, N = 36	Usual care, Baseline, N = 34	Usual care, 8 week, N = 34	Usual care, 12 month, N = 34
Discontinuation 8 weeks: Intervention = 2 withdrew, 1 underwent surgery. Control = 2 withdrew, 1 did not tolerate facemask. 12 months:	n = NA ; % = NA	n = 3 ; % = 8.3	n = 8 ; % = 22.2	n = NA ; % = NA	n = 3 ; % = 8.8	n = 6 ; % = 17.6

Outcome	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 36	Physiotherapy - </=45 minutes, <5 days a week, 8 week, N = 36	Physiotherapy - </=45 minutes, <5 days a week, 12 month, N = 36	Usual care, Baseline, N = 34	Usual care, 8 week, N = 34	Usual care, 12 month, N = 34
Intervention: 3 withdrew, 1 died during follow up, 1 not available, 1 underwent surgery, 1 admitted to hospital, 1 low back pain. Control = 4 withdrew, 1 did not tolerate facemask, 1 not available. No of events						

Discontinuation - Polarity - Lower values are better

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

Physiotherapy-</=45minutes,<5daysaweekcomparedtoUsualcareat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - </=45 minutes, <5 days a week-Usual care-t8

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

Glasgow Augmented Physiotherapy Study, 2004

Bibliographic Reference	Glasgow Augmented Physiotherapy Study, group; Can augmented physiotherapy input enhance recovery of mobility after stroke? A randomized controlled trial; Clinical Rehabilitation; 2004; vol. 18 (no. 5); 529-37

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	United Kingdom
Study setting	At stroke rehabilitation facilities at Stobhill, Drumchapel and Lighturn Hospitals, in Glasgow, Scotland.
Study dates	No additional information
Sources of funding	The UK Stroke Association funded the study
Inclusion criteria	People recently admitted to stroke rehabilitation facilities with a clinical diagnosis of stroke within the previous 6 weeks and able to tolerate and benefit from mobility rehabilitation
Exclusion criteria	Communication impairment; previous history of stroke; cognitive impairment (AMT ≤8); no sitting balance; pre-stroke Rankin >2; dementia; unconfirmed stroke; carcinoma; arthritis limiting activities of daily living; unstable angina (limits exercise); COPD limiting exercise; major surgery (3 months); poorly controlled diabetes; recent myocardial infarction (3 months); peripheral vascular disease limiting exercise

Recruitment / selection of participants	People admitted to one of the study rehabilitation services
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=35 Conventional stroke services plus additional physiotherapy input (aiming to approximately double the total daily physiotherapy time to 60-80 minutes per day, five days a week). Concomitant therapy: All people received conventional stroke services, including conventional physiotherapy (30-40 minutes, five days per week)
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=35 Conventional stroke services only. Concomitant therapy: All people received conventional stroke services, including conventional physiotherapy (30-40 minutes, five days per week)
Number of participants	70

Duration of follow-up	4 weeks (likely end of intervention), 3 months and 6 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Environmental factors: Hospital
Additional comments	Intention-to-treat

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 35)
Conventional stroke services plus additional physiotherapy input (aiming to approximately double the total daily physiotherapy time to 60-80 minutes per day, five days a week). Concomitant therapy: All people received conventional stroke services, including conventional physiotherapy (30-40 minutes, five days per week)

Physiotherapy - </=45 minutes, 5 days a week (N = 35)
Conventional stroke services only. Concomitant therapy: All people received conventional stroke services, including conventional physiotherapy (30-40 minutes, five days per week)

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 35)	Physiotherapy - </=45 minutes, 5 days a week (N = 35)
% Female Sample size	n = 11 ; % = 31	n = 18 ; % = 51
Mean age (SD) (years) Mean (SD)	68 (11)	67 (10)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Rankin Score 0 Sample size	n = 18 ; % = 51	n = 17 ; % = 49
Rankin Score 1 Sample size	n = 10 ; % = 29	n = 14 ; % = 40
Rankin Score 2 Sample size	n = 7 ; % = 20	n = 4 ; % = 11

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 35)	Physiotherapy - </=45 minutes, 5 days a week (N = 35)
Time period since stroke (days) Mean (SD)	22 (14)	25 (18)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

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

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 35	Physiotherapy - >1 to 2 hours, 5 days a week, 3 month, N = 32	Physiotherapy - >1 to 2 hours, 5 days a week, 6 month, N = 30	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 35	Physiotherapy - </=45 minutes, 5 days a week, 3 month, N = 34	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 34
Activities of daily living (barthel index) Scale range: 0-100. Final values at 3	11.8 (3.3)	16.6 (2.8)	5.1 (3.7)	10.3 (3.1)	16.1 (3.3)	5.9 (4.1)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 35	Physiotherapy - >1 to 2 hours, 5 days a week, 3 month, N = 32	Physiotherapy - >1 to 2 hours, 5 days a week, 6 month, N = 30	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 35	Physiotherapy - </=45 minutes, 5 days a week, 3 month, N = 34	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 34
months, change scores at 6 months. Mean (SD)						
Physical function - lower limb (Rivermead Mobility Index) Scale range: 0-15. Change scores. Mean (SD)	NR (NR)	4.7 (2.8)	5.1 (2.7)	NR (NR)	3.5 (2.8)	4.4 (3.2)
Person/participant generic health-related quality of life (EuroQol) Scale range: 0-100. Change scores. Mean (SD)	53.7 (18.2)	NR (NR)	9.78 (30.8)	52.4 (18.9)	NR (NR)	-2 (20.8)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - lower limb (Rivermead Mobility Index) - Polarity - Higher values are better
Person/participant generic health-related quality of life (EuroQol) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 35	Physiotherapy - >1 to 2 hours, 5 days a week, 3 month, N = 35	Physiotherapy - >1 to 2 hours, 5 days a week, 6 month, N = 35	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 35	Physiotherapy - </=45 minutes, 5 days a week, 3 month, N = 35	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 35
Discontinuation Intervention: 2 partial completion, 1 refused, 1 unwell, 2 died. Control: 1 refused. No of events	n = NA ; % = NA	n = NR ; % = NR	n = 6 ; % = 17.1	n = NA ; % = NA	n = NR ; % = NR	n = 1 ; % = 2.9

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t3

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(RivermeadMobilityIndex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t3

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(RivermeadMobilityIndex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EuroQol)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Godecke, 2016

Bibliographic Reference	Godecke, E.; Armstrong, E. A.; Rai, T.; Middleton, S.; Ciccone, N.; Whitworth, A.; Rose, M.; Holland, A.; Ellery, F.; Hankey, G. J.; Cadilhac, D. A.; Bernhardt, J.; A randomized controlled trial of very early rehabilitation in speech after stroke; International Journal of Stroke; 2016; vol. 11 (no. 5); 586-92

Study details

Secondary publication of another included study- see primary study for details	Godecke, E.; Armstrong, E.; Rai, T.; Ciccone, N.; Rose, M. L.; Middleton, S.; Whitworth, A.; Holland, A.; Ellery, F.; Hankey, G. J.; Cadilhac, D. A.; Bernhardt, J.; Group, Verse Collaborative; A randomized control trial of intensive aphasia therapy after acute stroke: The Very Early Rehabilitation for SpEech (VERSE) study; International Journal of Stroke; 2020; 1747493020961926

Godecke, 2020

Bibliographic Reference	Godecke, E.; Armstrong, E.; Rai, T.; Ciccone, N.; Rose, M. L.; Middleton, S.; Whitworth, A.; Holland, A.; Ellery, F.; Hankey, G. J.; Cadilhac, D. A.; Bernhardt, J.; Group, Verse Collaborative; A randomized control trial of intensive aphasia therapy after acute stroke: The Very Early Rehabilitation for SpEech (VERSE) study; International Journal of Stroke; 2020; 1747493020961926

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	Godecke, E.; Hird, K.; Lalor, E. E.; Rai, T.; Phillips, M. R.; Very early poststroke aphasia therapy: a pilot randomized controlled efficacy trial; International Journal of Stroke; 2012; vol. 7 (no. 8); 635-44 Godecke, E.; Armstrong, E. A.; Rai, T.; Middleton, S.; Ciccone, N.; Whitworth, A.; Rose, M.; Holland, A.; Ellery, F.; Hankey, G. J.; Cadilhac, D. A.; Bernhardt, J.; A randomized controlled trial of very early rehabilitation in speech after stroke; International Journal of Stroke; 2016; vol. 11 (no. 5); 586-92

Trial name / registration number	ACTRN12613000776707
Study type	Randomised controlled trial (RCT)
Study location	Australia and New Zealand
Study setting	17 acute hospitals with later follow up at 45 subacute and community healthcare centers
Study dates	2014 to 2018
Sources of funding	The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Erin Godecke—NHMRC Funding: App1083010, APP1132468, App1153236, NIH (UK) HS&DR Program funding; Elizabeth Armstrong—NHMRC Funding: APP1132468; Tapan Rai reports no disclosures; Miranda L Rose—NHMRC Funding: App1083010, App1153236; Fiona Ellery FE reports personal fees from Florey Institute of Neurosciences and Mental Health, The University of Melbourne during the conduct of the study; Graham J Hankey has received honoraria from Bayer for lecturing at sponsored scientific symposia and consulting on advisory boards about stroke prevention in atrial fibrillation; Dominique A Cadilhac—NHMRC Funding App1063761, App1154273; Julie Bernhardt—NHMRC Funding JB—App1154904, App1058635. This study was funded by National Health and Medical Research Council (APP1044973), The Tavistock Trust for Aphasia (UK), Edith Cowan University, Australia.
Inclusion criteria	Aged over 18 years and admitted to hospital with an acute stroke, resultant acute aphasia of any type, within 14 days of stroke onset. They required a score of less than 93.7 on the Aphasia Quotient of the Revised Western Aphasia Battery (WAB-R AQ) indicating mild to severe aphasia. They were medically stable, could maintain a wakeful alert state for at least 30 minutes, and had normal or corrected hearing and vision.
Exclusion criteria	Pre-existing aphasia and dementia; a concurrent progressive neurological disorder; any head injury; neurosurgery; clinical depression at admission; inability to participate in English-based therapy; participation in other concurrent intervention trials.
Recruitment / selection of participants	People with the capacity to consent were recruited from 17 acute-care hospitals in Australia and New Zealand

Intervention(s)	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week N=164 VERSE/UC-Plus intervention - usual care therapy plus additional aphasia therapy. This involved a combination of therapy at the discretion of therapist. People were prescribed 20 sessions of 45-60 minutes (15-20 hours, or 4-5 hours per week) of aphasia therapy, commencing before day 15 and completed within four weeks. VERSE treatment was an impairment-based therapy program. The VERSE intervention prioritized error-free, verbal communication, encouraging conversation while working between 50% and 80% accuracy at each goal level to maintain a therapy challenge point. In both higher intensity groups, the amount of therapy and the timing of commencement of intervention were standardised. Concomitant therapy: No additional information
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mixed Mild, moderate and severe in about equal amounts

Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Mixed All had aphasia, but some had dysarthria and apraxia of speech
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and Language therapy - </= 45 minutes, <5 days a week N=81 Usual care was not controlled for amount, frequency of sessions, therapy type or therapist. On average they had 3.1 sessions per week, with each session being on average 37.2 hours. Concomitant therapy: No additional information
Number of participants	246
Duration of follow-up	3 months and 6 months (end of intervention = 4 weeks)

Indirectness	No additional information
Elements of the study relating to qualitative themes	People requiring specific consideration People with communication difficulties Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	Intention to treat analysis. Their analysis combined the two high intensity groups for the assessment of the primary outcome.

Study arms

Speech and Language therapy - >45 minutes to 1 hour, 5 days a week (N = 164)
VERSE/UC-Plus intervention - usual care therapy plus additional aphasia therapy. This involved a combination of therapy at the discretion of therapist. People were prescribed 20 sessions of 45-60 minutes (15-20 hours, or 4-5 hours per week) of aphasia therapy, commencing before day 15 and completed within four weeks. VERSE treatment was an impairment-based therapy program. The VERSE intervention prioritized error-free, verbal communication, encouraging conversation while working between 50% and 80% accuracy at each goal level to maintain a therapy challenge point. In both higher intensity groups, the amount of therapy and the timing of commencement of intervention were standardised. Concomitant therapy: No additional information

Speech and Language therapy - </= 45 minutes, <5 days a week (N = 81)
Usual care was not controlled for amount, frequency of sessions, therapy type or therapist. On average they had 3.1 sessions per week, with each session being on average 37.2 hours. Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	**Speech and Language therapy - >45 minutes to 1 hour, 5 days a week (N = 164)**	**Speech and Language therapy - </= 45 minutes, <5 days a week (N = 81)**
% Female Sample size	n = 80 ; % = 49	n = 43 ; % = 53
Mean age (SD) (years) Mean (SD)	75 (18)	76 (17)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Dysphagia present Sample size	n = 89 ; % = 54	n = 43 ; % = 53

Characteristic	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week (N = 164)	Speech and Language therapy - </= 45 minutes, <5 days a week (N = 81)
Severity Western Aphasia Battery-Revised Aphasia Quotient Sample size	n = NA ; % = NA	n = NA ; % = NA
Mild (93.6-62.6) Sample size	n = 47	n = 25 ; % = 31
Moderate (62.5-31.3) Sample size	n = 49 ; % = 30	n = 24 ; % = 29
Severe (0-31.2) Sample size	n = 68 ; % = 41	n = 32 ; % = 40
Time period since stroke (days) Mean (SD)	10 (5)	9 (4)
Type of communication difficulty Aphasia Sample size	n = 164 ; % = 100	n = 81 ; % = 100
AusTOMS-dysarthria - no impairment Sample size	n = 80 ; % = 49	n = 50 ; % = 62
Apraxia of speech - no impairment Sample size	n = 79 ; % = 48	n = 38 ; % = 47

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)
- 26 week (≥6 months)

Speech and Language therapy - >45 minutes to 1 hour, 5 days a week compared to Speech and Language therapy - </= 45 minutes, <5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 164	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 12 week, N = 147	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 147	Speech and Language therapy - </= 45 minutes, <5 days a week, Baseline, N = 81	Speech and Language therapy - </= 45 minutes, <5 days a week, 12 week, N = 70	Speech and Language therapy - </= 45 minutes, <5 days a week, 26 week, N = 70
Communication - overall language ability (Western Aphasia Battery-Revised Aphasia Quotient) Scale range: 0-100. Final values. Mean (SD)	40.5 (27.8)	67.2 (29.9)	71.7 (28.9)	42.4 (28.9)	70.02 (28.7)	75.7 (25.3)
Communication - Impairment specific measures, naming (Boston Naming Test) (number of	13.2 (16.3)	30.3 (20.8)	34.6 (20)	15.9 (17.4)	31.3 (18.8)	37.5 (18)

Outcome	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 164	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 12 week, N = 147	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 147	Speech and Language therapy - </= 45 minutes, <5 days a week, Baseline, N = 81	Speech and Language therapy - </= 45 minutes, <5 days a week, 12 week, N = 70	Speech and Language therapy - </= 45 minutes, <5 days a week, 26 week, N = 70
incorrect names) Final values Mean (SD)						
Person/participant generic-health related quality of life (Stroke and Aphasia Quality of Life Scale-39) Scale range: 1-5. Final values. Mean (SD)	NR (NR)	3.3 (0.87)	3.5 (0.82)	NR (NR)	3.6 (0.76)	3.65 (0.76)
Psychological distress - depression (Aphasia Depression Rating Scale) Scale range: 0-32. Final values. Mean (SD)	NR (NR)	5.6 (3.88)	4.2 (3.3)	NR (NR)	5.6 (3.77)	4.76 (3.8)

Communication - overall language ability (Western Aphasia Battery-Revised Aphasia Quotient) - Polarity - Higher values are better
Communication - Impairment specific measures, naming (Boston Naming Test) - Polarity - Lower values are better
Person/participant generic-health related quality of life (Stroke and Aphasia Quality of Life Scale-39) - Polarity - Higher values are better
Psychological distress - depression (Aphasia Depression Rating Scale) - Polarity - Lower values are better

Speech and Language therapy - >45 minutes to 1 hour, 5 days a week compared to Speech and Language therapy - </= 45 minutes, <5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 164	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 12 week, N = 164	Speech and Language therapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 164	Speech and Language therapy - </= 45 minutes, <5 days a week, Baseline, N = 81	Speech and Language therapy - </= 45 minutes, <5 days a week, 12 week, N = 81	Speech and Language therapy - </= 45 minutes, <5 days a week, 26 week, N = 81
Discontinuation 3 months. Intervention: 28 did not receive intervention, 10 deaths, 8 withdrew/unwell. Control: 4 deaths, 7 withdrew/unwell. 6 months: Intervention: 28 did not receive intervention, 14 deaths, 11 withdrew/unwell, 1 lost to follow up. Control: 4 deaths, 11 withdrew/unwell, 3 lost to follow up. No of events	n = NA ; % = NA	n = 46 ; % = 28	n = 54 ; % = 33	n = NA ; % = NA	n = 11 ; % = 14	n = 18 ; % = 22

Discontinuation - Polarity - Lower values are better

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Communication-overalllanguageability(WesternAphasiaBattery-RevisedAphasiaQuotient)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t12

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Communication-overalllanguageability(WesternAphasiaBattery-RevisedAphasiaQuotient)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t26

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Communication-Impairmentspecificmeasures,naming(BostonNamingTest)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t12

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Communication-Impairmentspecificmeasures,naming(BostonNamingTest)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t26

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgeneric-healthrelatedqualityoflife(StrokeandAphasiaQualityofLifeScale-39)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t12

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgeneric-healthrelatedqualityoflife(StrokeandAphasiaQualityofLifeScale-39)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t26

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Psychologicaldistress-depression(AphasiaDepressionRatingScale)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t12

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-continuousoutcomes-Psychologicaldistress-depression(AphasiaDepressionRatingScale)-MeanSD-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t26

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t12

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

SpeechandLanguagetherapy->45minutesto1hour,5daysaweekcomparedtoSpeechandLanguagetherapy-</=45minutes,<5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language therapy - >45 minutes to 1 hour, 5 days a week-Speech and Language therapy - </= 45 minutes, <5 days a week-t26

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

Godecke, 2012

Bibliographic Reference	Godecke, E.; Hird, K.; Lalor, E. E.; Rai, T.; Phillips, M. R.; Very early poststroke aphasia therapy: a pilot randomized controlled efficacy trial; International Journal of Stroke; 2012; vol. 7 (no. 8); 635-44

Study details

Secondary publication of another included study- see primary study for details	Godecke, E.; Armstrong, E.; Rai, T.; Ciccone, N.; Rose, M. L.; Middleton, S.; Whitworth, A.; Holland, A.; Ellery, F.; Hankey, G. J.; Cadilhac, D. A.; Bernhardt, J.; Group, Verse Collaborative; A randomized control trial of intensive aphasia therapy after acute stroke: The Very Early Rehabilitation for SpEech (VERSE) study; International Journal of Stroke; 2020; 1747493020961926

Guo, 2019

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

Study details

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

Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	China.
Study setting	Inpatients.
Study dates	January 2015 to December 2017.
Sources of funding	Zhejiang Province, medical and health science and technology projects (no. 2018PY033).
Inclusion criteria	People with a disease duration more than 6 months; a modified disease duration more than 6 months; a modified Ashworth scale score more than 1 and less than 4 for the upper limb flexor tension.
Exclusion criteria	Cognitive problems; cannot understand and follow simple verbal instructions.
Recruitment / selection of participants	People who were inpatients from the Department of Oncology, the Second Affiliated Hospital of Wenzhou Medical University, China.
Intervention(s)	Occupational therapy - >45 minutes-1 hour, 5 days a week N=60 Combination of two groups: Mirror therapy (n=30) and mirror therapy with extracorporeal shockwave therapy (n=30). People sat on a stool in front of a table with a 30cm2 mirror. The affected hand was placed behind the mirror so that it could not be seen, while the affected hand was infront of the affected side. They were asked to move their wrist while simultaneously observing the movement of their unaffected hand. In the group receiving extracorporeal shockwave therapy,

	they received 2000 shots with a pressure of 2.0-3.0 bar and a frequency of 8 Hz diffusely for the intrinsic muscles and flexor digitorum tendon of the hand by an ultrasound pointer guide. Concomitant therapy: All people received conventional rehabilitation therapy for 30 minutes per day, five times a week for 4 weeks. The conventional program consisted of exercise therapy, occupational therapy and neurodevelopment facilitation techniques. A third group (n=30) reported in the study was not included in the analysis. They received extracorporeal shockwave therapy in addition to usual care, but no additional occupational therapy input in terms of active therapy. This did require additional time, but did not require active therapy. Therefore, they were excluded from the analysis to maintain consistency with other decisions in the review.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - <45 minutes, 5 days a week N=30 Usual care only. Concomitant therapy: All people received conventional rehabilitation therapy for 30 minutes per day, five times a week for 4 weeks. The conventional program consisted of exercise therapy, occupational therapy and neurodevelopment facilitation techniques.
Number of participants	90 (120 in total).

Duration of follow-up	12 months in total (intervention for 4 weeks).
Indirectness	Intervention indirectness - Due to the combination of extracorporeal shockwave therapy with occupational therapy without extracorporeal shockwave therapy being available in the control group.
Elements of the study relating to qualitative themes	Individual therapy Hospital care Supervision
Additional comments	Intention to treat (no drop outs).

Study arms

Occupational therapy - >45 minutes-1 hour, 5 days a week (N = 60)
Combination of two groups: Mirror therapy (n=30) and mirror therapy with extracorporeal shockwave therapy (n=30). People sat on a stool in front of a table with a 30cm2 mirror. The affected hand was placed behind the mirror so that it could not be seen, while the affected hand was infront of the affected side. They were asked to move their wrist while simultaneously observing the movement of their unaffected hand. In the group receiving extracorporeal shockwave therapy, they received 2000 shots with a pressure of 2.0-3.0 bar and a frequency of 8 Hz diffusely for the intrinsic muscles and flexor digitorum tendon of the hand by an ultrasound pointer guide. Concomitant therapy: All people received conventional rehabilitation therapy for 30 minutes per day, five times a week for 4 weeks. The conventional program consisted of exercise therapy, occupational therapy and neurodevelopment facilitation techniques.

Occupational therapy - <45 minutes, 5 days a week (N = 30)
Usual care only. Concomitant therapy: All people received conventional rehabilitation therapy for 30 minutes per day, five times a week for 4 weeks. The conventional program consisted of exercise therapy, occupational therapy and neurodevelopment facilitation techniques.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >45 minutes-1 hour, 5 days a week (N = 60)	Occupational therapy - <45 minutes, 5 days a week (N = 30)
% Female Sample size	n = 25 ; % = 42	n = 14 ; % = 47
Mean age (SD) (years) Mean (SD)	67.94 (10.93)	69.72 (11.13)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	3.27 (5)	3.49 (5.09)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 month (<6 months)
- 12 month (>6 months)

Continuous outcomes

Outcome	Occupational therapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 60	Occupational therapy - >45 minutes-1 hour, 5 days a week, 3 month, N = 60	Occupational therapy - >45 minutes-1 hour, 5 days a week, 12 month, N = 60	Occupational therapy - <45 minutes, 5 days a week, Baseline, N = 30	Occupational therapy - <45 minutes, 5 days a week, 3 month, N = 30	Occupational therapy - <45 minutes, 5 days a week, 12 month, N = 30
Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) Scale range: 0-66. Final values. Mirror therapy 3 months: 18.62 (2.91). 12 months: 22.23 (2.12). Mirror therapy and ESWT 3 months: 22.13 (3.15). 12 months: 29.73 (2.35). Mean (SD)	12.75 (2.52)	20.38 (3.5)	25.98 (4.37)	12.36 (2.38)	17.23 (3.91)	19.46 (2.87)

Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Occupational therapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 60	Occupational therapy - >45 minutes-1 hour, 5 days a week, 3 month, N = 60	Occupational therapy - >45 minutes-1 hour, 5 days a week, 12 month, N = 60	Occupational therapy - <45 minutes, 5 days a week, Baseline, N = 30	Occupational therapy - <45 minutes, 5 days a week, 3 month, N = 30	Occupational therapy - <45 minutes, 5 days a week, 12 month, N = 30
Discontinuation from the study No of events	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0

Discontinuation from the study - Polarity - Lower values are better

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

Continuousoutcomes-Physicalfunction-upperextremity(FuglMeyerAssessmentUpperExtremity)-MeanSD-Occupational therapy - >45 minutes-1 hour, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the combination of extracorporeal shockwave therapy with occupational therapy without extracorporeal shockwave therapy being available in the control group.)*

Continuousoutcomes-Physicalfunction-upperextremity(FuglMeyerAssessmentUpperExtremity)-MeanSD-Occupational therapy - >45 minutes-1 hour, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the combination of extracorporeal shockwave therapy with occupational therapy without extracorporeal shockwave therapy being available in the control group.)*

Dichotomousoutcomes-Discontinuationfromthestudy-NoOfEvents-Occupational therapy - >45 minutes-1 hour, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the combination of extracorporeal shockwave therapy with occupational therapy without extracorporeal shockwave therapy being available in the control group.)*

Dichotomousoutcomes-Discontinuationfromthestudy-NoOfEvents-Occupational therapy - >45 minutes-1 hour, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t12

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Partially applicable *(Due to the combination of extracorporeal shockwave therapy with occupational therapy without extracorporeal shockwave therapy being available in the control group.)*

Han, 2013

Bibliographic Reference	Han, C.; Wang, Q.; Meng, P. P.; Qi, M. Z.; Effects of intensity of arm training on hemiplegic upper extremity motor recovery in stroke patients: a randomized controlled trial; Clinical Rehabilitation; 2013; vol. 27 (no. 1); 75-81

Study details

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

Study location	China
Study setting	People admitted to the Affiliated Hospital of Qingdao University Medical College
Study dates	November 2009 to October 2011
Sources of funding	This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.
Inclusion criteria	First ever stroke in a territory of the middle cerebral artery (MCA); impaired motor function of arm which was due to one or more of the following: weakness, sensory loss, ataxia, visuospatial impairment; able to tolerate the interventions and evaluations; no excessive spasticity at the affected fingers, wrist, and elbow, as defined as a score of 3 or more on the Modified Ashworth Scale; no excessive pain in the affected arm, as measured by a score of 4 or more on a 10-point visual analogue scale; gave consent.
Exclusion criteria	Subarachnoid haemorrhage; age <25 or >80 years; recurrent stroke.
Recruitment / selection of participants	People admitted to the Affiliated Hospital of Qingdao University Medical College between November 2009 and October 2010
Intervention(s)	Physiotherapy - >2 to 4 hours, 5 days a week N=11 Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 3 hours, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment. Physiotherapy - >1 to 2 hours, 5 days a week N=10

	Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 2 hours, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=11 Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 1 hour, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment.
Number of participants	32
Duration of follow-up	6 weeks (end of intervention) (they also follow people up at 2 weeks and 4 weeks)
Indirectness	Population indirectness - The exclusion criteria excludes people with subarachnoid haemorrhage who are stated to be included in this review's protocol

Elements of the study relating to qualitative themes	Person-centred care - Therapy sessions could be split throughout the day if people were tired or uncomfortable Person factors Fatigue - People could split sessions of therapy throughout the day if they were fatigued Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	Method of analysis unclear. Appears that only people who completed the study were included in the analysis (not ITT).

Study arms

Physiotherapy - >2 to 4 hours, 5 days a week (N = 11)
Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 3 hours, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment.

Physiotherapy - >1 to 2 hours, 5 days a week (N = 10)
Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 2 hours, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
Arm motor relearning programme adapted on the person's impairments to include correct positioning and caring of the arm; passive, assisted and active movements; strength training; practice of functional activities. Delivered for 1 hour, 5 days a week for 6 weeks. If people felt tired or uncomfortable, the duration of the therapy could be distributed during the day. Concomitant therapy: All patients received regular rehabilitation therapy and medical treatment.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 11)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 10)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
% Female Sample size	n = 2 ; % = 18	n = 2 ; % = 20	n = 3 ; % = 27
Mean age (SD) (years) Mean (SD)	44.6 (12.87)	53.7 (11.13)	52.4 (12.47)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Comorbidities	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 11)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 10)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
Sample size			
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	38.3 (20.96)	42.9 (37.68)	41.4 (18.82)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 11	Physiotherapy - >2 to 4 hours, 5 days a week, 6 week, N = 10	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 10	Physiotherapy - >1 to 2 hours, 5 days a week, 6 week, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 10
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	50.5 (23.33)	89.5 (6.85)	62.5 (20.98)	88 (10.33)	51.5 (22.49)	85 (11.79)
Physical function - upper limb (Fugl Meyer Assessment) Scale range: 0-66. Final values. Mean (SD)	6.5 (3.06)	24.5 (7.96)	8.2 (3.43)	19.7 (7.09)	6.7 (2.26)	13 (6.38)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - upper limb (Fugl Meyer Assessment) - Polarity - Higher values are better

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcomes

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 11	Physiotherapy - >2 to 4 hours, 5 days a week, 6 week, N = 11	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 10	Physiotherapy - >1 to 2 hours, 5 days a week, 6 week, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 11
Discontinuation >2-4 hours = 1 discontinued (withdrew). >45 minutes to 1 hour = 1 discontinued (pneumonia). No of events	n = NA ; % = NA	n = 1 ; % = 9	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 1 ; % = 9

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable *(Population indirectness - excludes people with subarachnoid haemorrhage)*

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Population indirectness - excludes people with subarachnoid haemorrhage)*

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Partially applicable *(Population indirectness - excludes people with subarachnoid haemorrhage)*

Harris, 2009

Bibliographic Reference	Harris, J. E.; Eng, J. J.; Miller, W. C.; Dawson, A. S.; A self-administered Graded Repetitive Arm Supplementary Program (GRASP) improves arm function during inpatient stroke rehabilitation: a multi-site randomized controlled trial; Stroke; 2009; vol. 40 (no. 6); 2123-8

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	Canada
Study setting	Four inpatient sites in Canada
Study dates	September 2006 to December 2007, retention data collection completed by March 2008
Sources of funding	This work was supported from an operating grant from the Heart and Stroke Foundation of British Columbia and Yukon, Canada. Further support for this study was given in a career scientist award from Canadian Institute of Health Research (CIHR) to J.J.E. and W.C.M. and the Michael Smith Foundation for Health Research (to J.J.E.), and a CIHR Fellowship Award and Strategic Training Fellowship in Rehabilitation Research from the CIHR Musculoskeletal and Arthritis Institute to J.E.H.
Inclusion criteria	Confirmed infarct or haemorrhage by a neurologist using either magnetic resonance imaging or computer axial tomography; presence of active scapular elevation against gravity and palpatable wrist extension (grade 1); Fugl-Meyer Upper Limb Motor Impairment scale score between 10 and 57.

Exclusion criteria	Unstable cardiovascular status; significant upper limb musculoskeletal or neurological condition other than stroke; a Mini Mental Status examination <20; receptive aphasia.
Recruitment / selection of participants	People admitted to an acute care facility who were then transferred to 1 of the 4 participating sites for rehabilitation at approximately 2 weeks post stroke
Intervention(s)	Physiotherapy - >2 to 4 hours, 6 days a week N=53 GRASP protocol. Self-administered homework-based exercise program to improve paretic upper performance and encourage the use of the paretic upper limb in activities of daily living. Three exercise protocols around mild, moderate and severe problems. Each exercise was graded by varying repetitions to meet each person's need. Exercises included strengthening of the arm and hand, range of motion, gross and find motor skills. Repetitive goal and task oriented activities were designed to simulate partial or whole skills sets required in activities of daily living. The site coordinator taught and monitored (once per week) the protocol. Each participant was asked to complete the exercises 6 days per week for 60 minutes each day. A log sheet was included in each exercise book for participants to track the amount of time and number of days the protocol was completed, as well as any pain and fatigue experienced. By the end of the program, participants kept the exercise book and kit and were asked to continue the program at home until the next assessment session in three months time. Concomitant therapy: People received rehabilitation by the unit multidisciplinary team in addition to the experimental or control group protocols (this included physical therapy and occupational therapy). This was the equivalent of around 90 minutes of therapy, 5 days a week.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team

Comparator	Physiotherapy - >1 to 2 hours, 5 days a week N=50 Received an education book with 4 modules, discussing information on stroke recovery and general health with a homework assignment related to the topic. They met with the site coordinator once per week to review the information and the homework assignment to achieve the same time with the site coordinator. Concomitant therapy: People received rehabilitation by the unit multidisciplinary team in addition to the experimental or control group protocols (this included physical therapy and occupational therapy). This was the equivalent of around 90 minutes of therapy, 5 days a week.
Number of participants	103
Duration of follow-up	3 months (end of intervention = 4 weeks)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person factors Fatigue - Fatigue was reported at low, with a mean 3.0 (0.75) of a possible 7.0 over the 4 weeks of the intervention. Intervention factors Individual therapy 'Homework'/self management interventions

	Provision of feedback - the once a week sessions with the study coordinator provided opportunities to provide feedback Environmental factors Hospital care, then home
Additional comments	Intention-to-treat analysis

Study arms

Physiotherapy - >2 to 4 hours, 6 days a week (N = 53)
GRASP protocol. Self-administered homework-based exercise program to improve paretic upper performance and encourage the use of the paretic upper limb in activities of daily living. Three exercise protocols around mild, moderate and severe problems. Each exercise was graded by varying repetitions to meet each person's need. Exercises included strengthening of the arm and hand, range of motion, gross and find motor skills. Repetitive goal and task oriented activities were designed to simulate partial or whole skills sets required in activities of daily living. The site coordinator taught and monitored (once per week) the protocol. Each participant was asked to complete the exercises 6 days per week for 60 minutes each day. a log sheet was included in each exercise book for participants to track the amount of time and number of days the protocol was completed, as well as any pain and fatigue experienced. By the end of the program, participants kept the exercise book and kit and were asked to continue the program at home until the next assessment session in three months time. Concomitant therapy: People received rehabilitation by the unit multidisciplinary team in addition to the experimental or control group protocols (this included physical therapy and occupational therapy). This was the equivalent of around 90 minutes of therapy, 5 days a week.

Physiotherapy - >1 to 2 hours, 5 days a week (N = 50)
Received an education book with 4 modules, discussing information on stroke recovery and general health with a homework assignment related to the topic. They met with the site coordinator once per week to review the information and the homework assignment to achieve the same time with the site coordinator. Concomitant therapy: People received rehabilitation by the unit

multidisciplinary team in addition to the experimental or control group protocols (this included physical therapy and occupational therapy). This was the equivalent of around 90 minutes of therapy, 5 days a week.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >2 to 4 hours, 6 days a week (N = 53)**	**Physiotherapy - >1 to 2 hours, 5 days a week (N = 50)**
% Female Sample size	n = 22 ; % = 42	n = 22 ; % = 44
Mean age (SD) (years) Mean (SD)	69.4 (11.7)	69.3 (15.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NA	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	20.5 (7.1)	20.8 (7)

Characteristic	Physiotherapy - >2 to 4 hours, 6 days a week (N = 53)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 50)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 month (<6 months)

Physiotherapy - >2 to 4 hours, 6 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >2 to 4 hours, 6 days a week, Baseline, N = 53	Physiotherapy - >2 to 4 hours, 6 days a week, 3 month, N = 53	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 50	Physiotherapy - >1 to 2 hours, 5 days a week, 3 month, N = 50
Physical function - upper limb (Action Research Arm Test) Scale range: 0-57. Change scores. Mean (95% CI)	31.1 (NR to NR)	11.7 (8.8 to 14.3)	31 (NR to NR)	7 (4 to 10.4)

Physical function - upper limb (Action Research Arm Test) - Polarity - Higher values are better

Physiotherapy - >2 to 4 hours, 6 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >2 to 4 hours, 6 days a week, Baseline, N = 53	Physiotherapy - >2 to 4 hours, 6 days a week, 3 month, N = 53	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 50	Physiotherapy - >1 to 2 hours, 5 days a week, 3 month, N = 50
Discontinuation Intervention: did not receive allocated intervention = 3. Control: Did not receive allocated intervention = 6. No of events	n = NA ; % = NA	n = 3 ; % = 6	n = NA ; % = NA	n = 6 ; % = 12

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->2to4hours,6daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekat<6months-continuousoutcome-Physicalfunction-upperlimb(ActionResearchArmTest)-MeanNineFivePercentCI-Physiotherapy - >2 to 4 hours, 6 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-t3

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

Physiotherapy->2to4hours,6daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >2 to 4 hours, 6 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-t3

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

Horsley, 2019

Bibliographic Reference	Horsley, S.; Lannin, N. A.; Hayward, K. S.; Herbert, R. D.; Additional early active repetitive motor training did not prevent contracture in adults receiving task-specific upper limb training after stroke: a randomised trial; Journal of Physiotherapy; 2019; vol. 65 (no. 2); 88-94

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	Three inpatient rehabilitation units in Australia
Study dates	No additional information
Sources of funding	KS Hayward is supported by the National Health and Medical Research Council of Australia (GNT1088449). RD Herbert is supported by the National Health and Medical Research Council of Australia (RG153190)
Inclusion criteria	Aged at least 18 years; at least 10 days and no more than 6 months post-onset; unable to actively extend the affected wrist past neutral or unable to flex the affected shoulder to >90 degrees with the elbow extended.
Exclusion criteria	Had language, comprehension or cognitive problems that prevented informed consent; had co-existing upper-limb problems that directly affected movement (eg, fractures, inflammatory arthritis, peripheral nerve injury or burns); unable to participate in upper limb rehabilitation.
Recruitment / selection of participants	People were recruited on admission to one of three participating inpatient rehabilitation units located at Caloundra Hospital, the Townsville Hospital and Sunshine Coast University Hospital.
Intervention(s)	Occupational therapy - >1 to 2 hours, 5 days a week N=25 Repetitive active reaching training using the SMART Arm device for up to 1 hour per day, 5 days a week for 5 weeks (a goal of 25 sessions, 1500 minutes), in addition to usual upper limb therapy. The SMART Arm provided visual and auditory feedback of performance and external support to achieve physical practice using outcome-triggered electrical stimulation. It enabled repetitive practice of forward reaching involving shoulder flexion, external rotation and elbow extension with the hand and forearm supported in the functional position by a splint. It can also incorporate practice of hand tasks such as grasp/release involving forearm supination, wrist extension, radial deviation and hand movements.

	Concomitant therapy: Usual upper limb therapy provided by treating occupational therapists and physiotherapists. This usually involved both group and individual sessions conducted 5 days a week, and consisted of strengthening and task-specific practice of upper limb activities. This averaged out to 53 minutes per session.
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - >45 minutes to 1 hour, 5 days a week N=25 Usual upper limb therapy only. Concomitant therapy: Usual upper limb therapy provided by treating occupational therapists and physiotherapists. This usually involved both group and individual sessions conducted 5 days a week, and consisted of strengthening and task-specific practice of upper limb activities. This averaged out to 53 minutes per session.
Number of participants	50
Duration of follow-up	7 weeks (5 weeks = end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors Individual and group-based therapy Telerehabilitation, assistive technology and computer-based tools Provision of feedback - auditory and visual feedback was provided by the machine throughout training Environmental factors Hospital care Use of expensive equipment
Additional comments	Intention-to-treat analysis

Study arms

Occupational therapy - >1 to 2 hours, 5 days a week (N = 25)
Repetitive active reaching training using the SMART Arm device for up to 1 hour per day, 5 days a week for 5 weeks (a goal of 25 sessions, 1500 minutes), in addition to usual upper limb therapy. The SMART Arm provided visual and auditory feedback of performance and external support to achieve physical practice using outcome-triggered electrical stimulation. It enabled repetitive practice of forward reaching involving shoulder flexion, external rotation and elbow extension with the hand and forearm supported in the functional position by a splint. It can also incorporate practice of hand tasks such as grasp/release involving forearm supination, wrist extension, radial deviation and hand movements. Concomitant therapy: Usual upper limb therapy provided by treating

occupational therapists and physiotherapists. This usually involved both group and individual sessions conducted 5 days a week, and consisted of strengthening and task-specific practice of upper limb activities. This averaged out to 53 minutes per session.

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 25)
Usual upper limb therapy only. Concomitant therapy: Usual upper limb therapy provided by treating occupational therapists and physiotherapists. This usually involved both group and individual sessions conducted 5 days a week, and consisted of strengthening and task-specific practice of upper limb activities. This averaged out to 53 minutes per session.

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - >1 to 2 hours, 5 days a week (N = 25)**	**Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 25)**
% Female Sample size	n = 9 ; % = 36	n = 13 ; % = 52
Mean age (SD) (years) Mean (SD)	65.9 (12.7)	68.5 (13)
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA
Indigenous Sample size	n = 1 ; % = 4	n = 0 ; % = 0
Non-indigenous	n = 24 ; % = 96	n = 25 ; % = 100

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 25)	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 25)
Sample size		
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	28.3 (27.1)	24.9 (14.1)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 7 week (<6 months)

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcome

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Occupational therapy - >1 to 2 hours, 5 days a week, 7 week, N = 23	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 25	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 7 week, N = 22
Physical function - Upper limb (Motor Assessment Scale) Composite score of the three upper limb items. Scale range: 0-18. Final values. Mean (SD)	1.5 (3.6)	4.4 (5.4)	0.8 (1.4)	3.1 (4.9)

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

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Occupational therapy - >1 to 2 hours, 5 days a week, 7 week, N = 25	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 25	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 7 week, N = 25
Discontinuation Intervention: 2 lost to follow up. Control: 3 lost to follow up. No of events	n = NR ; % = NR	n = 2 ; % = 8	n = NR ; % = NR	n = 3 ; % = 12

Discontinuation - Polarity - Lower values are better

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

Occupational therapy->1to2hours,5daysaweekcomparedtoOccupational therapy->45minutesto1hour,5daysaweekat<6months-continuousoutcome-Physicalfunction-Upperlimb(MotorAssessmentScale)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t7

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

Occupational therapy->1to2hours,5daysaweekcomparedtoOccupational therapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t7

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

Howe, 2005

Bibliographic Reference	Howe, T. E.; Taylor, I.; Finn, P.; Jones, H.; Lateral weight transference exercises following acute stroke: a preliminary study of clinical effectiveness; Clinical Rehabilitation; 2005; vol. 19 (no. 1); 45-53

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	The Stroke Unit at The James Cook University Hospital, Middlesbrough, United Kingdom.
Study dates	10th September 2001 to 14th February 2002.
Sources of funding	Funding from the Physiotherapy Research Foundation
Inclusion criteria	Aged over 18 years with an acute vascular stroke (haemorrhage or infarct) presenting with hemiplegia; medically stable; able to co-operate with treatment and give informed consent; previously independently mobile indoors with or without a stick around their home; previously independent in personal activities of daily living.
Exclusion criteria	A history of any other neurological pathology; conditions affecting balance, vertigo, medication affecting balance, dementia, impaired conscious levels or concomitant medical illness or musculoskeletal conditions affecting upper limb, hips or spine impairing their ability to undergo therapy; people with serious perceptual problems (assessed using the Rivermead

	Perceptual Assessment Battery and the Rey-Osterreith Complex figure copying test with scores below 30); severe receptive dysfunction; those classified as having the 'pusher syndrome' determined clinically.
Recruitment / selection of participants	Consecutive patients admitted to the stroke unit
Intervention(s)	Physiotherapy - >1 to 2 hours, <5 days a week N=17 12 additional therapy sessions (6 hour over four weeks) comprising exercises aimed at improving lateral weight transference in sitting delivered by trained physiotherapy assistants. This included repetition (practice) of self-initiated goal-oriented activities in various postures with, where appropriate, manual guidance and verbal encouragement of these movement strategies (feedback). Reaching in sitting or standing postures is preceded and accompanied by postural adjustments resulting in segmental alignment. Concomitant therapy: Usual care, including physiotherapy (14 sessions, 480 minutes in total, 34 minutes each session) over 4 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team Physiotherapists and rehabilitation assistants
Comparator	Physiotherapy - </=45 minutes to 1 hour, <5 days a week N=18 Usual care only. Concomitant therapy: Usual care, including physiotherapy (14 sessions, 480 minutes in total, 34 minutes each session) over 4 weeks.

Number of participants	35
Duration of follow-up	8 weeks (end of intervention = 4 weeks)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Provision of feedback - feedback was provided during exercises Environmental factors Hospital care
Additional comments	Per protocol analysis (only data from people with measurements at all three visits were analysed)

Study arms

Physiotherapy - >1 to 2 hours, <5 days a week (N = 17)
12 additional therapy sessions (6 hour over four weeks) comprising exercises aimed at improving lateral weight transference in sitting delivered by trained physiotherapy assistants. This included repetition (practice) of self-initiated goal-oriented activities in various postures with, where appropriate, manual guidance and verbal encouragement of these movement strategies (feedback). Reaching in

sitting or standing postures is preceded and accompanied by postural adjustments resulting in segmental alignment. Concomitant therapy: Usual care, including physiotherapy (14 sessions, 480 minutes in total, 34 minutes each session) over 4 weeks.

Physiotherapy - </=45 minutes to 1 hour, <5 days a week (N = 18)
Usual care only. Concomitant therapy: Usual care, including physiotherapy (14 sessions, 480 minutes in total, 34 minutes each session) over 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, <5 days a week (N = 17)**	**Physiotherapy - </=45 minutes to 1 hour, <5 days a week (N = 18)**
% Female Sample size	n = 8 ; % = 47	n = 9 ; % = 50
Mean age (SD) (years) Mean (SD)	71.5 (10.9)	70.7 (7.6)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 to 2 hours, <5 days a week (N = 17)	Physiotherapy - </=45 minutes to 1 hour, <5 days a week (N = 18)
Time period since stroke (days) Mean (SD)	26.5 (15.7)	23.1 (17.5)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - </=45 minutes to 1 hour, <5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 14	Physiotherapy - >1 to 2 hours, <5 days a week, 8 week, N = 14	Physiotherapy - </=45 minutes to 1 hour, <5 days a week, Baseline, N = 12	Physiotherapy - </=45 minutes to 1 hour, <5 days a week, 8 week, N = 15
Physical function - lower limb (Stand-to-Sit test) (seconds) Final values Mean (SD)	5.1 (7.7)	3.1 (3.1)	3.9 (3.3)	2.5 (1.3)

Physical function - lower limb (Stand-to-Sit test) - Polarity - Lower values are better

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - </=45 minutes to 1 hour, <5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 17	Physiotherapy - >1 to 2 hours, <5 days a week, 8 week, N = 17	Physiotherapy - </=45 minutes to 1 hour, <5 days a week, Baseline, N = 18	Physiotherapy - </=45 minutes to 1 hour, <5 days a week, 8 week, N = 18
Discontinuation Treatment: 1 unwilling to return for testing following discharge, 1 brain tumour. Control: 2 unwilling to return for testing following discharge. No of events	n = NR ; % = NR	n = 2 ; % = 12	n = NR ; % = NR	n = 2 ; % = 11

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-</=45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(Stand-to-Sittest)-MeanSD-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - </=45 minutes to 1 hour, <5 days a week-t8

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-</=45minutesto1hour,<5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - </=45 minutes to 1 hour, <5 days a week-t8

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

Hunter, 2011

Bibliographic Reference	Hunter, S. M.; Hammett, L.; Ball, S.; Smith, N.; Anderson, C.; Clark, A.; Tallis, R.; Rudd, A.; Pomeroy, V. M.; Dose-response study of mobilisation and tactile stimulation therapy for the upper extremity early after stroke: a phase I trial; Neurorehabilitation and neural repair; 2011; vol. 25 (no. 4); 314-322

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	NCT00360997
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	2 center, randomised controlled trial - inpatient setting in London and Staffordshire
Study dates	No additional information
Sources of funding	The Stroke Association provided funding for this study
Inclusion criteria	People who had an infarct or haemorrhage in the anterior cerebral circulation 8 to 84 days before recruitment; paralyzed or substantially paretic upper limb (<61/100 on the MI Arm Section); ability to follow a single-stage command using their nonparetic upper limb
Exclusion criteria	Clinically important upper limb pain or upper limb movement deficits attributable to pathology other than stroke
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >2 to 4 hours, 5 days a week N=20 Up to 120 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention.

	Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes. Physiotherapy - >1 to 2 hours, 5 days a week N=19 Up to 60 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes. Physiotherapy - 45 minutes to 1 hour, 5 days a week N=18 Up to 30 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention.

	Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=19 No mobilisation and tactile stimulation intervention. Usual therapy only. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.
Number of participants	76
Duration of follow-up	14 days (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - The timing and amount of therapy was balanced against the person's preference, fatigue level and other needs. Person factors

	Fatigue - Fatigue was considered when deciding how much therapy to provide Support from family and friends - The involvement of time with family and friends was considered while deciding when therapy should be given Healthcare professionals factors Communication - communication from healthcare professionals was analysed by the researchers Intervention factors Individual therapy Environmental factors Hospital care Service factors Use of therapy timetabling - The therapy was scheduled around other ward activities
Additional comments	Inferred to be intention to treat (all people were analysed in their original groups regardless of how much therapy they received)

Study arms

Physiotherapy - >2 to 4 hours, 5 days a week (N = 20)
Up to 120 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.

Physiotherapy - >1 to 2 hours, 5 days a week (N = 19)
Up to 60 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.

Physiotherapy - 45 minutes to 1 hour, 5 days a week (N = 18)
Up to 30 minutes per day of mobilisation and tactile stimulation (including joint and soft-tissue mobilisation and passive or active-assisted movement) every working day for 14 consecutive working days. Experimental interventions had to fit around routine care and not interfere with therapy sessions, ward rounds, meal times or medical investigations. In addition, the delivery of therapy was done taking into account participants' experience of fatigue, their preferences for timing of the intervention, and the visits of their family and friends. All these factors could potentially reduce the planned amount of therapy. Consequently, the research therapists paid particular attention to communication with clinical staff and participants regarding the flexible timing of intervention. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.

Physiotherapy - </=45 minutes, 5 days a week (N = 19)
No mobilisation and tactile stimulation intervention. Usual therapy only. Concomitant therapy: Everyone received usual therapy, which was physiotherapy delivered clinically for 30 minutes.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 20)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 19)	Physiotherapy - 45 minutes to 1 hour, 5 days a week (N = 18)	Physiotherapy - </=45 minutes, 5 days a week (N = 19)
% Female Sample size	n = 11 ; % = 55	n = 11 ; % = 58	n = 7 ; % = 39	n = 9 ; % = 47
Mean age (SD) (years) Mean (SD)	72.5 (15.3)	72.9 (7.9)	73.3 (7.3)	71.6 (14.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 20)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 19)	Physiotherapy - 45 minutes to 1 hour, 5 days a week (N = 18)	Physiotherapy - </=45 minutes, 5 days a week (N = 19)
Time period since stroke (days) Mean (SD)	28.3 (19.5)	25.7 (16.4)	35.6 (23.6)	29.4 (15.2)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 14 day (<6 months)

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week, Physiotherapy - 45 minutes to 1 hour, 5 days a week, Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 20	Physiotherapy - >2 to 4 hours, 5 days a week, 14 day, N = 20	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 19	Physiotherapy - >1 to 2 hours, 5 days a week, 14 day, N = 18	Physiotherapy - 45 minutes to 1 hour, 5 days a week, Baseline, N = 18	Physiotherapy - 45 minutes to 1 hour, 5 days a week, 14 day, N = 18	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 14 day, N = 19
Physical function - upper limb (Action Research Arm Test) Scale range: 0-57. Final values. Mean (95% CI)	NR (NR to NR)	9.8 (0 to 18.9)	NR (NR to NR)	6.6 (0 to 13.4)	NR (NR to NR)	6.8 (0 to 9.7)	NR (NR to NR)	6.5 (0 to 11.4)
Physical function - upper limb (Action Research Arm Test) Scale range: 0-	NR (NR)	9.8 (0.003)	NR (NR)	6.6 (0.026)	NR (NR)	6.8 (0.005)	NR (NR)	6.5 (0.024)

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 20	Physiotherapy - >2 to 4 hours, 5 days a week, 14 day, N = 20	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 19	Physiotherapy - >1 to 2 hours, 5 days a week, 14 day, N = 18	Physiotherapy - 45 minutes to 1 hour, 5 days a week, Baseline, N = 18	Physiotherapy - 45 minutes to 1 hour, 5 days a week, 14 day, N = 18	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 14 day, N = 19
57. Final values. Mean (p value)								
Physical function - upper limb (Action Research Arm Test) Scale range: 0-57. Final values. Median (IQR)	0 (0 to 6.5)	NA (NA to NA)	0 (0 to 19)	NA (NA to NA)	0 (0 to 0)	NA (NA to NA)	0 (0 to 3)	NA (NA to NA)

Physical function - upper limb (Action Research Arm Test) - Polarity - Higher values are better

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week, Physiotherapy - 45 minutes to 1 hour, 5 days a week, Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 20	Physiotherapy - >2 to 4 hours, 5 days a week, 14 day, N = 20	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 19	Physiotherapy - >1 to 2 hours, 5 days a week, 14 day, N = 19	Physiotherapy - 45 minutes to 1 hour, 5 days a week, Baseline, N = 18	Physiotherapy - 45 minutes to 1 hour, 5 days a week, 14 day, N = 18	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 14 day, N = 19
Discontinuation >1 to 2 hours: 1 lost to outcome No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 1 ; % = 5	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweek,Physiotherapy-45minutesto1hour,5daysaweek,Physiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-upperlimb(ActionResearchArmTest)-MeanPValue-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - 45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t14

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweek,Physiotherapy-45minutesto1hour,5daysaweek,Physiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - 45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t14

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

Huseyinsinoglu, 2012

Bibliographic Reference	Huseyinsinoglu, B. E.; Ozdincler, A. R.; Krespi, Y.; Bobath Concept versus constraint-induced movement therapy to improve arm functional recovery in stroke patients: a randomized controlled trial; Clinical Rehabilitation; 2012; vol. 26 (no. 8); 705-15

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	The outpatient clinic of the Stroke Unit of the Florence Nightingale Hospital
Study dates	July 2008 to April 2010.
Sources of funding	No specific grant from any funding agency in the public, commercial or not-for-profit sectors.
Inclusion criteria	A history of first-time stroke (3-24 months post stroke); patients between 18 and 80 years of age; active range of motion of at least 45 degrees of shoulder flexion, abduction or scaption, 20 degrees of elbow extension, 20 degrees of wrist extension from full flexion position, and 10 degrees of active extension of metacarpophalangeal joints and each interphalangeal joint of all digits; ability to maintain standing balance for two minutes with arm support if necessary; adequate vision and hearing to understand the test and therapy sessions; adequate communication skills; considerable non-use of the affected upper limb (Amount of us and Quality of movement score <2.5 on Motor Activity Log-28); weakness of the affected arm.
Exclusion criteria	Serious cognitive disorders; exhibit excessive pain that would interfere with the ability to participate in the treatment; show excessive spasticity in any joint of the affected arm (score at least 2 on the Modified Ashworth Scale in any joint)
Recruitment / selection of participants	Post-stroke patients who were admitted to the physiotherapy department of the stroke unit
Intervention(s)	Physiotherapy - >2 to 4 hours, 5 days a week N=13 Constraint-induced movement therapy group who received training 3 hours per day during 10 consecutive weekdays. The participant's less-affected hand was placed in the protective safety mitt for a total of 90% of their waking hours for a period of 12 consecutive days. Behavioural techniques (behavioural contract, caregiver contract, home practice, home diary, home skill assignment) designed to transfer gains from the treatment setting to daily life were applied. Shaping and task activities were provided during the individualised therapy sessions. Activities were selected by considering specific joint movements

	that exhibited the most pronounced deficits and the joint movements that physical therapists believed had the greatest potential for improvement. Concomitant therapy: No additional information
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency

Subgroup 5: Type of communication difficulty	Not stated/unclear
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=11 The Bobath Concept group who received individualised therapy sessions, 1 hour daily for 10 consecutive week days. Appropriate, relevant and patient-centred goals were set up before the therapy sessions. The therapist analysed the movement and task performance related to the rehabilitation goal to identify activity limitations and problems of movement dysfunction. Therapy sessions were planned according to those identified limitation for each patient. The emphasis was on control of muscle tone, quality of movement, external support, weight-bearing and stability of trunk during arm activity in functional situations with various positions (lying, sitting and standing both with and without objects and during unilateral or bilateral tasks). Depending on the Bobath Concept's discourse each patient trained about normal stimuli, correct positioning of arm and was given home exercises to continue the therapy 24 hours a day. Caregivers were also trained on the home exercise programme. Concomitant therapy: No additional information
Number of participants	24

Duration of follow-up	2 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Carer/family member factors Continuity of care - Carers and family members were also trained in the interventions and goals were set with them so they could support the stroke survivor at home Support from family and friends Intervention factors Individual therapy 'Homework'/self management interventions - while the main intervention was not made up of this, both groups received 'homework' tasks Level of person centred care - both interventions were individualised for the person Goal setting - Goal setting was completed for both groups Environmental factors Hospital care and home

Additional comments	Not intention-to-treat

Study arms

Physiotherapy - >2 to 4 hours, 5 days a week (N = 13)
Constraint-induced movement therapy group who received training 3 hours per day during 10 consecutive weekdays. The participant's less-affected hand was placed in the protective safety mitt for a total of 90% of their waking hours for a period of 12 consecutive days. Behavioural techniques (behavioural contract, caregiver contract, home practice, home diary, home skill assignment) designed to transfer gains from the treatment setting to daily life were applied. Shaping and task activities were provided during the individualised therapy sessions. Activities were selected by considering specific joint movements that exhibited the most pronounced deficits and the joint movements that physical therapists believed had the greatest potential for improvement. Concomitant therapy: No additional information

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
The Bobath Concept group who received individualised therapy sessions, 1 hour daily for 10 consecutive week days. Appropriate, relevant and patient-centred goals were set up before the therapy sessions. The therapist analysed the movement and task performance related to the rehabilitation goal to identify activity limitations and problems of movement dysfunction. Therapy sessions were planned according to those identified limitation for each patient. The emphasis was on control of muscle tone, quality of movement, external support, weight-bearing and stability of trunk during arm activity in functional situations with various positions (lying, sitting and standing both with and without objects and during unilateral or bilateral tasks). Depending on the Bobath Concept's discourse each patient trained about normal stimuli, correct positioning of arm and was given home exercises to continue the therapy 24 hours a day. Caregivers were also trained on the home exercise programme. Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 13)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
% Female Sample size	n = 4 ; % = 36	n = 6 ; % = 55
Mean age (SD) (years) Mean (SD)	49.1 (13.7)	48.2 (15.4)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	10.6 (6.1)	13.1 (6.3)
Type of communication difficulty Sample size	n = 1 ; % = 9.1	n = 0 ; % = 0

Outcomes

Study timepoints

- Baseline
- 2 week (<6 months)

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 13	Physiotherapy - >2 to 4 hours, 5 days a week, 2 week, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 2 week, N = 11
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	112.2 (12.5)	116.3 (11.1)	112 (13.4)	115.7 (10.9)
Physical function - lower limb (Wolf Motor Function Test Performance Time) (seconds) Scale range: 0-120. Final values. Mean (SD)	25.6 (19)	15.2 (13.7)	31.5 (23.7)	20.5 (18)

Activities of daily living (functional independence measure) - Polarity - Higher values are better
Physical function - lower limb (Wolf Motor Function Test Performance Time) - Polarity - Lower values are better

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 13	Physiotherapy - >2 to 4 hours, 5 days a week, 2 week, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 2 week, N = 11
Discontinuation Intervention: 2 dropouts due to personal choice No of events	n = NA ; % = NA	n = 2 ; % = 15	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t2

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(WolfMotorFunctionTestPerformanceTime)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t2

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t2

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

Ikbali Afsar, 2018

Bibliographic Reference	Ikbali Afsar, S.; Mirzayev, I.; Umit Yemisci, O.; Cosar Saracgil, S. N.; Virtual Reality in Upper Extremity Rehabilitation of Stroke Patients: a Randomized Controlled Trial; Journal of stroke and cerebrovascular diseases; 2018; vol. 27 (no. 12); 3473-3478

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	People admitted to an inpatient rehabilitation facility
Study dates	April 2014 to March 2015
Sources of funding	No additional information
Inclusion criteria	A first episode of unilateral stroke for hemiparesis (diagnosed by a neurologist based on the clinical features as supported by computed tomography or magnetic resonance imaging findings); stroke duration less than 6 months and more than 1 month; medically stable enough to participate in active rehabilitation; mild-to-moderate motor upper extremity deficits (Brunnstrome stage for the upper extremity at least 3); ability to execute at least 20 degrees of active shoulder flexion and abduction against gravity; no problems with auditory or visual functioning; a total score of 23 or greater on the Mini Mental State Examination

Exclusion criteria	Severe conditions such as uncontrolled blood pressure or angina; history of epilepsy; any intervention other than conventional therapy; refusal to play a video game.
Recruitment / selection of participants	People admitted to the inpatient rehabilitation facility between April 2014 and March 2015
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=19 Additional Xbox Kinect game system 30 minutes per day. Xbox Kinect system (XBOX 360, Kinect, Microsoft Inc) is a commercial video game technology that provides body control of animated virtual characters. This device can recognize and track user movements in real time without requiring a special controller, through an infrared camera sensor. It does not require buttons to be pressed for movement to be recognized, enabling users with impaired motor skills also play the game in an effect manner. The console and monitor were set up in an isolated and quiet room so that external factors would not influence the results. The patient sat in a wheelchair 1.5-2 meters away from the Kinect sensor. People were informed about the game ahead of time and then showed how to play. The following games were used: Mouse Mayhem, Traffic Control, Balloon Buster and Mathercising from Dr. Kawashima's Body and Brain Exercises package. The programs required active movements of the upper extremity. The patients actively performed bilateral shoulder abduction and adduction, and active elbow flexion and extension movements in the "Mouse Mayhem" and "Traffic Control" games. They actively performed flexion and extension movements in both the shoulder and elbow joints in the "Balloon Buster" and "Mathercising" games. Programs continued for a total of 30 minutes per session. During the 4 weeks of the intervention, participants used all the provided games. Concomitant therapy: All people received 60 minutes of conventional therapy for upper extremity, 5 times per week for 4 weeks. Convention rehabilitation aimed to normalize movement patterns and minimize spasticity. Physical therapy included static and dynamic control of position, balance skills, weight shift and activities of daily living. Moreover, proprioceptive neuromuscular facilitation and neurodevelopmental facilitation techniques were selected by the physical therapists based on the requirement of each person. The program was performed for 60 minutes.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=16 Conventional therapy only. Concomitant therapy: All people received 60 minutes of conventional therapy for upper extremity, 5 times per week for 4 weeks. Convention rehabilitation aimed to normalize movement patterns and minimize spasticity. Physical therapy included static and dynamic control of position, balance skills, weight shift and activities of daily living. Moreover, proprioceptive neuromuscular facilitation and neurodevelopmental facilitation techniques were selected by the physical therapists based on the requirement of each person. The program was performed for 60 minutes.
Number of participants	35
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - several different games were available to move between

	Physical environment - required space for a console and monitor, as well as the ability to be 2 meters away from the sensor Environmental factors Hospital care Use of expensive equipment
Additional comments	Not intention to treat (excludes people who dropped out)

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 21)
Additional Xbox Kinect game system 30 minutes per day. Xbox Kinect system (XBOX 360, Kinect, Microsoft Inc) is a commercial video game technology that provides body control of animated virtual characters. This device can recognize and track user movements in real time without requiring a special controller, through an infrared camera sensor. It does not require buttons to be pressed for movement to be recognized, enabling users with impaired motor skills also play the game in an effect manner. The console and monitor were set up in an isolated and quiet room so that external factors would not influence the results. The patient sat in a wheelchair 1.5-2 meters away from the Kinect sensor. People were informed about the game ahead of time and then showed how to play. The following games were used: Mouse Mayhem, Traffic Control, Balloon Buster and Mathercising from Dr. Kawashima's Body and Brain Exercises package. The programs required active movements of the upper extremity. The patients actively performed bilateral shoulder abduction and adduction, and active elbow flexion and extension movements in the "Mouse Mayhem" and "Traffic Control" games. They actively performed flexion and extension movements in both the shoulder and elbow joints in the "Balloon Buster" and "Mathercising" games. Programs continued for a total of 30 minutes per session. During the 4 weeks of the intervention, participants used all the provided games. Concomitant therapy: All people received 60 minutes of conventional therapy for upper extremity, 5 times per week for 4 weeks. Convention rehabilitation aimed to normalize movement patterns and minimize spasticity. Physical therapy included static and dynamic control of position, balance skills, weight shift and activities of daily living. Moreover,

proprioceptive neuromuscular facilitation and neurodevelopmental facilitation techniques were selected by the physical therapists based on the requirement of each person. The program was performed for 60 minutes.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 21)
Conventional therapy only. Concomitant therapy: All people received 60 minutes of conventional therapy for upper extremity, 5 times per week for 4 weeks. Convention rehabilitation aimed to normalize movement patterns and minimize spasticity. Physical therapy included static and dynamic control of position, balance skills, weight shift and activities of daily living. Moreover, proprioceptive neuromuscular facilitation and neurodevelopmental facilitation techniques were selected by the physical therapists based on the requirement of each person. The program was performed for 60 minutes.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, 5 days a week (N = 21)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 21)**
% Female Sample size	n = 7 ; % = 37	n = 8 ; % = 50
Mean age (SD) (years) Mean (SD)	69.42 (8.55)	63.44 (15.73)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 21)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 21)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	88.32 (56.32)	68.63 (39.2)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 19	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 16
Activities of daily living - Functional independence	12.74 (2.51)	11 (3.16)	13.63 (3.61)	10.33 (3.79)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 19	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 16
measure self-care score Scale range: 6-42. Only reports one subscale of the functional indepedence measure. Change score. Mean (SD)				
Physical function - upper limb (Fugl Meyer Upper Extremity) Scale range: 0-66. Change score. Mean (SD)	24.32 (7.87)	18.74 (7.67)	19.88 (3.79)	13.94 (6.58)

Activities of daily living - Functional independence measure self-care score - Polarity - Higher values are better
Physical function - upper limb (Fugl Meyer Upper Extremity) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 21
Discontinuation Overall: 7 dropped out because of early discharge from hospital No of events	n = NA ; % = NA	n = 2 ; % = 10	n = NA ; % = NA	n = 5 ; % = 24

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving-Functionalindependencemeasureself-carescore-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerUpperExtremity)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Ikizler May, 2020

Bibliographic Reference	Ikizler May, H.; Ozdolap, S.; Mengi, A.; Sarikaya, S.; The effect of mirror therapy on lower extremity motor function and ambulation in post-stroke patients: A prospective, randomized-controlled study; Turkish Journal of Physical Medicine and Rehabilitation; 2020; vol. 66 (no. 2); 154-160

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	Unclear
Study dates	No additional information
Sources of funding	The authors received no financial support for the research and/or authorship of this article
Inclusion criteria	Having experienced a stroke within the previous year; baseline Brunnstrom Stage 1-4, being ambulatory before the stroke.
Exclusion criteria	The presence of any cognitive disorder that could affect the study results; a history of recurrent stroke; any visual disorder that could affect vision of the image in the mirror; having neglect, apraxia, aphasia and psychological or emotional problems.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >2 to 4 hours, 5 days a week N=21 Mirror therapy for 30 minutes in each session in addition to the conventional rehabilitation program. The people were seated on a chair and a mirror (40x70cm) was placed vertically between the two lower extremities. The reflective surface of the mirror only showed the non-paretic lower extremity. The person was instructed to make repeated ankle dorsiflexion and plantar flexion and to watch the movement in the mirror. The patients were not allowed to move the paretic extremity during the procedure. The mirror therapy was performed by a single physiotherapist for all patients.

	Concomitant therapy: A conventional rehabilitation program for 4 weeks (60-120 minutes/day for 5 days a week). A patient-specific conventional rehabilitation program included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Not stated/unclear
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >1 to 2 hours, 5 days a week N=21 Conventional rehabilitation program only. Concomitant therapy: A conventional rehabilitation program for 4 weeks (60-120 minutes/day for 5 days a week). A patient-specific conventional rehabilitation program included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.
Number of participants	42
Duration of follow-up	4 weeks (end of intervention) and 12 weeks (<6 months).
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy

Additional comments	ITT no participants lost

Study arms

Physiotherapy - >2 to 4 hours, 5 days a week (N = 21)
Mirror therapy for 30 minutes in each session in addition to the conventional rehabilitation program. The people were seated on a chair and a mirror (40x70cm) was placed vertically between the two lower extremities. The reflective surface of the mirror only showed the non-paretic lower extremity. The person was instructed to make repeated ankle dorsiflexion and plantar flexion and to watch the movement in the mirror. The patients were not allowed to move the paretic extremity during the procedure. The mirror therapy was performed by a single physiotherapist for all patients. Concomitant therapy: A conventional rehabilitation program for 4 weeks (60-120 minutes/day for 5 days a week). A patient-specific conventional rehabilitation program included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.

Physiotherapy - >1 to 2 hours, 5 days a week (N = 21)
Conventional rehabilitation program only. Concomitant therapy: A conventional rehabilitation program for 4 weeks (60-120 minutes/day for 5 days a week). A patient-specific conventional rehabilitation program included neurofacilitation techniques, sensorimotor re-education, active exercises, ambulation techniques, balance and walking training. All exercises were carried out under the supervision of a single physiotherapist.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >2 to 4 hours, 5 days a week (N = 21)	Physiotherapy - >1 to 2 hours, 5 days a week (N = 21)
% Female Sample size	n = 6 ; % = 28.6	n = 11 ; % = 52.4
Mean age (SD) (years) Mean (SD)	57.2 (7.6)	58.8 (9.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Range	15 to 365	15 to 300
Time period since stroke (days) Median (IQR)	60 (NR to NR)	30 (NR to NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >2 to 4 hours, 5 days a week, 12 week, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, 12 week, N = 21
Activities of daily living (Functional independence measure total) Scale range: 18-126. Final values. Mean (SD)	70.1 (19.7)	107.4 (13.3)	58.6 (21.6)	74.3 (22.5)
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	12 (9.3)	39.5 (11.2)	8.6 (12.3)	15.9 (14.3)

Activities of daily living (Functional independence measure total) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >2 to 4 hours, 5 days a week compared to Physiotherapy - >1 to 2 hours, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >2 to 4 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >2 to 4 hours, 5 days a week, 12 week, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 21	Physiotherapy - >1 to 2 hours, 5 days a week, 12 week, N = 21
Discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(Functionalindependencemeasuretotal)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-t12

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-t12

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

Physiotherapy->2to4hours,5daysaweekcomparedtoPhysiotherapy->1to2hours,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >2 to 4 hours, 5 days a week-Physiotherapy - >1 to 2 hours, 5 days a week-t12

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

Jang, 2019

Bibliographic Reference	Jang, Kyung Won; Lee, Sook Joung; Kim, Sang Beom; Lee, Kyeong Woo; Lee, Jong Hwa; Park, Jin Gee; Effects of mechanical inspiration and expiration exercise on velopharyngeal incompetence in subacute stroke patients.; Journal of rehabilitation medicine; 2019; vol. 51 (no. 2); 97-102

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatients.
Study dates	May 2015 to July 2017.
Sources of funding	No additional information.
Inclusion criteria	People with subacute stroke who had swallowing difficulty who showed velopharyngeal incompetence.
Exclusion criteria	Those susceptible to barotrauma due to pulmonary diseases; those with a previous stroke; those with pharyngeal structural abnormalities; those unable to cooperate due to deteriorated cognitive function or mentality; those with medical conditions that could affect their swallowing ability.

Recruitment / selection of participants	People at the rehabilitation center of a university hospital, specifically a regional cerebrovascular center.
Intervention(s)	Speech and language therapy - >1-2 hours, 5 days a week N=21 Mechanical inspiration and expiration exercises for 30 minutes once daily, five days a week for 2 weeks in addition to usual care. Exercises were completed once daily using the CNS-100 Cough Assist. The treatment procedures used a starting positive pressure of 15-20 cm H2O increased to 40cm H2O according to the person's condition. Inspiration lasted 2s or longer if required and was titrated for the person's comfort. The treatment procedures for expiration were: starting with expiration was similar to inspiration pressure, and then the negative pressure was increased to 10-20 cm H2O above positive pressure. The negative pressure was then held for 3-6 s, simulating the airflows that occur naturally during the coughs. The person was then instructed to coordinate their respiratory rhythms according to those of the cough assist machine. Concomitant therapy: Conventional swallowing therapy consisting of oral motor and sensory stimulation, neuromuscular electrical stimulation of the suprahyoid muscle and oral and lingual exercises. 30 minute sessions twice a day, 5 days a week for 2 weeks.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Swallow
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and language therapy - >45 minutes-1 hour, 5 days a week N=20 Usual care only.

	Concomitant therapy: Conventional swallowing therapy consisting of oral motor and sensory stimulation, neuromuscular electrical stimulation of the suprahyoid muscle and oral and lingual exercises. 30 minute sessions twice a day, 5 days a week for 2 weeks.
Number of participants	41
Duration of follow-up	2 weeks (end of intervention)
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Individual therapy Use of expensive/additional equipment Hospital care Supervision - Supervision was required with instruction throughout
Additional comments	Method of analysis unclear. Appears to be completers only.

Study arms

Speech and language therapy - >1-2 hours, 5 days a week (N = 21)
Mechanical inspiration and expiration exercises for 30 minutes once daily, five days a week for 2 weeks in addition to usual care. Exercises were completed once daily using the CNS-100 Cough Assist. The treatment procedures used a starting positive pressure of 15-20 cm H2O increased to 40cm H2O according to the person's condition. Inspiration lasted 2s or longer if required and was titrated for the person's comfort. The treatment procedures for expiration were: starting with expiration was similar to inspiration pressure, and

then the negative pressure was increased to 10-20 cm H2O above positive pressure. The negative pressure was then held for 3-6 s, simulating the airflows that occur naturally during the coughs. The person was then instructed to coordinate their respiratory rhythms according to those of the cough assist machine. Concomitant therapy: Conventional swallowing therapy consisting of oral motor and sensory stimulation, neuromuscular electrical stimulation of the suprahyoid muscle and oral and lingual exercises. 30 minute sessions twice a day, 5 days a week for 2 weeks.

Speech and language therapy - >45 minutes-1 hour, 5 days a week (N = 20)
Usual care only. Concomitant therapy: Conventional swallowing therapy consisting of oral motor and sensory stimulation, neuromuscular electrical stimulation of the suprahyoid muscle and oral and lingual exercises. 30 minute sessions twice a day, 5 days a week for 2 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Speech and language therapy - >1-2 hours, 5 days a week (N = 21)**	**Speech and language therapy - >45 minutes-1 hour, 5 days a week (N = 20)**
% Female Sample size	n = 8 ; % = 44	n = 9 ; % = 50
Mean age (SD) (years) Mean (SD)	67.28 (9.48)	71.15 (8.61)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Speech and language therapy - >1-2 hours, 5 days a week (N = 21)	Speech and language therapy - >45 minutes-1 hour, 5 days a week (N = 20)
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	20.48 (13.56)	18.34 (12.45)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 2 week (End of intervention)

Continuous outcomes

Outcome	Speech and language therapy - >1-2 hours, 5 days a week, Baseline, N = 21	Speech and language therapy - >1-2 hours, 5 days a week, 2 week, N = 18	Speech and language therapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 20	Speech and language therapy - >45 minutes-1 hour, 5 days a week, 2 week, N = 18
Swallow function and ability (Penetration	7.62 (0.39)	-0.86 (1.24)	7.81 (0.7)	-0.76 (0.97)

Outcome	Speech and language therapy - >1-2 hours, 5 days a week, Baseline, N = 21	Speech and language therapy - >1-2 hours, 5 days a week, 2 week, N = 18	Speech and language therapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 20	Speech and language therapy - >45 minutes-1 hour, 5 days a week, 2 week, N = 18
Aspiration Scale) Scale range: 1-8. Change scores. Mean (SD)				

Swallow function and ability (Penetration Aspiration Scale) - Polarity - Lower values are better

Dichotomous outcomes

Outcome	Speech and language therapy - >1-2 hours, 5 days a week, Baseline, N = 21	Speech and language therapy - >1-2 hours, 5 days a week, 2 week, N = 21	Speech and language therapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 20	Speech and language therapy - >45 minutes-1 hour, 5 days a week, 2 week, N = 20
Discontinuation from study Intervention: 2 discharged early, 1 recurrent stroke. Control: 1 declined medical condition, 1 discharged early. No of events	n = NA ; % = NA	n = 3 ; % = 15	n = NA ; % = NA	n = 2 ; % = 10

Discontinuation from study - Polarity - Lower values are better

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

Continuousoutcomes-Swallowingfunctionandability(PenetrationAspirationScale)-MeanSD-Speech and language therapy - >1-2 hours, 5 days a week-Speech and language therapy - >45 minutes-1 hour, 5 days a week-t2

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

Dichotomousoutcomes-Withdrawalduetoadverseevents-NoOfEvents-Speech and language therapy - >1-2 hours, 5 days a week-Speech and language therapy - >45 minutes-1 hour, 5 days a week-t2

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

Jiang, 2020

Bibliographic Reference	Jiang, S; You, H; Zhao, W; Zhang, M; Effects of short-term upper limb robot-assisted therapy on the rehabilitation of sub-acute stroke patients; Technology and health care; 2020;

Study details

Secondary publication of	No additional information

another included study- see primary study for details	
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Inpatient rehabilitation ward in a hospital
Study dates	No additional information.
Sources of funding	This work was supported by a fund from the Lanzhou Science and Technology Bureau (document number: 2016-2-59).
Inclusion criteria	First ischaemic or haemorrhagic stroke as confirmed by neuroimaging (CT or MRI); age of 35 to 85 years; less than 30 days since stroke; impaired upper limb motor function and unilateral hemiplegia; sufficient cognition to understand the purpose and follow the instructions of the study (Mini Mental State Examination at least 18); ability to participate in robot therapy (Brunstromm assessment score 3-6); no visual problems.
Exclusion criteria	Drug abuse of epilepsy; painful arthritis of the elbow, wrist or finger joints; impaired cognition; former stroke; severe neuropsychologic impairments; severe spasticity (Ashworth 3-4).
Recruitment / selection of participants	People were recruited from their inpatient rehabilitation ward.

Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=23 Robot-assisted arm therapy (30 minutes twice a day, 5 days/week for 2 weeks) in addition to conventional therapy. Armeo(R) Spring arm robot used with a virtual reality game interface that matches the motor skills required to complete the exercise. The difficulty experienced by the patient gradually increases during practice, but could be adjusted by the therapist. Required a 100-inch projection display attached to the wall to provide visual and auditory feedback. Concomitant therapy: Conventional rehabilitation therapy 30 minutes twice a day, 5 days/week for 2 weeks (see comparator).
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed Virtual reality, robot assisted therapy and conventional therapy
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - >45 minutes-1 hour, 5 days a week N=22 Conventional rehabilitation therapy (30 minutes twice a day, 5 days/week for 2 weeks), including neurodevelopment techniques, functional tasks and muscle strengthening. Focussing on inducing active movements of the shoulders, elbows, wrists and hands of the person and performing muscle strengthening exercises. Occupational therapy involved fine-grained athletic performance through training, such as screw inlay, interspersed with daily exercise training, such as putting on clothes, buttoning shirts and brushing teeth, and muscle strengthening and balancing tasks. Concomitant therapy: Conventional rehabilitation therapy 30 minutes twice a day, 5 days/week for 2 weeks.
Number of participants	45

Duration of follow-up	1 month (follow up at 2 weeks [end of intervention] and 1 month).
Indirectness	No additional information
Elements of the study relating to qualitative themes	Telerehabilitation, assistive technology and computer-based tools Person centred care: Intensity tailored to the individual - Therapy was delivered twice a day in split sessions rather than in one single session. Intervention factors: Individual Feedback (computer based therapy): Difficulty of the intervention increased while playing games, but could be adjusted by a therapist if becoming too difficult. Need for technical support and training: A therapist needed to be present to adjust difficulty levels if becoming too difficult. The therapist needed to adjust factors each time while using the robot. Use of expensive equipment - Projection display and robot. Environmental factors: Physical environment: Required a room with a projection display and space for the robot. Hospital care

Additional comments	No information on method of analysis The study reports motricity index and functional independence measure. These are lower priority outcomes according to the system devised by the committee for physical function and activities of daily living respectively, and so will not be extracted.

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 23)
Robot-assisted arm therapy (30 minutes twice a day, 5 days/week for 2 weeks) in addition to conventional therapy. Armeo(R) Spring arm robot used with a virtual reality game interface that matches the motor skills required to complete the exercise. The difficulty experienced by the patient gradually increases during practice, but could be adjusted by the therapist. Required a 100-inch projection display attached to the wall to provide visual and auditory feedback. Concomitant therapy: Conventional rehabilitation therapy 30 minutes twice a day, 5 days/week for 2 weeks (see comparator).

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 22)
Conventional rehabilitation therapy (30 minutes twice a day, 5 days/week for 2 weeks), including neurodevelopment techniques, functional tasks and muscle strengthening. Focussing on inducing active movements of the shoulders, elbows, wrists and hands of the person and performing muscle strengthening exercises. Occupational therapy involved fine-grained athletic performance through training, such as screw inlay, interspersed with daily exercise training, such as putting on clothes, buttoning shirts and brushing teeth, and muscle strengthening and balancing tasks. Concomitant therapy: Conventional rehabilitation therapy 30 minutes twice a day, 5 days/week for 2 weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 23)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 22)
% Female Sample size	n = 9 ; % = 39.1	n = 7 ; % = 31.8
Mean age (SD) (years) Mean (SD)	NR (NR)	NR (NR)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities No of events	n = NR ; % = NR	n = NR ; % = NR
Diabetes No of events	n = 10 ; % = 43.5	n = 12 ; % = 54.5
Hypertension No of events	n = 16 ; % = 69.6	n = 14 ; % = 63.6
Drinking alcohol No of events	n = 9 ; % = 39.1	n = 11 ; % = 50
Smoking No of events	n = 8 ; % = 34.8	n = 4 ; % = 18.2

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 23)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 22)
Severity NIHSS Mean (SD)	6.13 (1.79)	6.05 (1.79)
Time period since stroke (days) Mean (SD)	20.09 (5.53)	19.41 (7.04)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 1 month (<6 months (latest time period used))

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes-1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 23	Physiotherapy - >1 to 2 hours, 5 days a week, 1 month, N = 23	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 22	Physiotherapy - >45 minutes-1 hour, 5 days a week, 1 month, N = 22
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	66.74 (13.02)	72.17 (13.47)	60 (11.34)	62.5 (12.13)
Physical function - upper limb (Fugl Meyer Assessment) Scale range: 0-66. Final values. Mean (SD)	39.83 (8.53)	48.87 (8.63)	36.36 (7.25)	41.91 (7.71)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - upper limb (Fugl Meyer Assessment) - Polarity - Higher values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutes-1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes-1 hour, 5 days a week-t1

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutes-1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes-1 hour, 5 days a week-t1

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

Jo, 2012

Bibliographic Reference	Jo, K; Yu, J; Jung, J; Effects of virtual reality-based rehabilitation on upper extremity function and visual perception in stroke patients: A randomized control trial; Journal of Physical Therapy Science; 2012; vol. 24 (no. 11); 1205-8.

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	The Republic of Korea
Study setting	The B Hospital in Korea
Study dates	In 2011.
Sources of funding	No additional information.
Inclusion criteria	Stroke patients
Exclusion criteria	VR-related treatment in the previous 2 years; internal or neurological surgery in the previous 2 months; specific medical problems, including psychological problems.

Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days N=15 Virtual reality training for 60 minute sessions, 5 times a week for 4 weeks. The Interactive Rehabilitation and Exercise System was used for VR-based training. The VR environment consisted of a chair, monitor, virtual game program, data gloves and video cameras. We selected 6 VR programs for our study: bird and balls, coconuts, drums, juggler, conveyor, and soccer. Each program was performed for 5 minutes, with a 1 minute break between programs. Subjects were asked to move the affected upper extremity. If subjects could not perform well, the therapist gave verbal cues or physical assistance. The difficulty of all programs could be controlled by adjusting the velocity, quantity, distance and angle of the VR object. Concomitant therapy: Traditional rehabilitation therapy, 30 minutes, 3 times a week for 4 weeks
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Not stated/unclear

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, <5 days a week N=14 Traditional rehabilitation therapy only. Concomitant therapy: Traditional rehabilitation therapy, 30 minutes, 3 times a week for 4 weeks

Number of participants	29
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - several different games Physical environment - Requiring space for a gaming system Environmental factors Hospital care Use of expensive equipment
Additional comments	No information about the method of analysis

Study arms

Physiotherapy - >1 to 2 hours, 5 days (N = 16)
Virtual reality training for 60 minute sessions, 5 times a week for 4 weeks. The Interactive Rehabilitation and Exercise System was used for VR-based training. The VR environment consisted of a chair, monitor, virtual game program, data gloves and video cameras. We selected 6 VR programs for our study: bird and balls, coconuts, drums, juggler, conveyor, and soccer. Each program was performed for 5 minutes, with a 1 minute break between programs. Subjects were asked to move the affected upper extremity. If subjects could not perform well, the therapist gave verbal cues or physical assistance. The difficulty of all programs could be controlled by adjusting the velocity, quantity, distance and angle of the VR object. Concomitant therapy: Traditional rehabilitation therapy, 30 minutes, 3 times a week for 4 weeks

Physiotherapy - </=45 minutes, <5 days a week (N = 15)
Traditional rehabilitation therapy only. Concomitant therapy: Traditional rehabilitation therapy, 30 minutes, 3 times a week for 4 weeks

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, 5 days (N = 16)**	**Physiotherapy - </=45 minutes, <5 days a week (N = 15)**
% Female Sample size	n = 5 ; % = 33	n = 6 ; % = 43
Mean age (SD) (years) Mean (SD)	64 (7.1)	63.7 (8.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 to 2 hours, 5 days (N = 16)	Physiotherapy - </=45 minutes, <5 days a week (N = 15)
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	NR (NR)	NR (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days compared to Physiotherapy - </=45 minutes, <5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days, Baseline, N = 16	Physiotherapy - >1 to 2 hours, 5 days, 4 week, N = 15	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 4 week, N = 14
Physical function - upper limb (Wolf Motor Function Test time) (seconds)	40.1 (22.4)	36.4 (21.1)	44.5 (13.6)	42.8 (13.1)

Outcome	Physiotherapy - >1 to 2 hours, 5 days, Baseline, N = 16	Physiotherapy - >1 to 2 hours, 5 days, 4 week, N = 15	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 4 week, N = 14
Scale range: 0-120. Final values. Mean (SD)				
Stroke-related scale of cognition - spatial attention (Motor-free visual perception test) Scale range: 0-46. Final values. Mean (SD)	23.6 (4.1)	26.8 (3.6)	23.4 (4.8)	23.9 (4.2)

Physical function - upper limb (Wolf Motor Function Test time) - Polarity - Lower values are better
Stroke-related scale of cognition - spatial attention (Motor-free visual perception test) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days compared to Physiotherapy - </=45 minutes, <5 days a week at <6 months - dichotomous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days, Baseline, N = 16	Physiotherapy - >1 to 2 hours, 5 days, 4 week, N = 16	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 4 week, N = 15
Discontinuation Reason not provided No of events	n = NA ; % = NA	n = 1 ; % = 6	n = NA ; % = NA	n = 1 ; % = 6

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5dayscomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(WolfMotorFunctionTesttime)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days-Physiotherapy - </=45 minutes, <5 days a week-t4

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

Physiotherapy->1to2hours,5dayscomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Stroke-relatedscaleofcognition-spatialattention(Motor-freevisualperceptiontest)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days-Physiotherapy - </=45 minutes, <5 days a week-t4

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

Physiotherapy->1to2hours,5dayscomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-dichotomousoutcomes-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days-Physiotherapy - </=45 minutes, <5 days a week-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Kang, 2012

Bibliographic Reference	Kang, J. H.; Park, R. Y.; Lee, S. J.; Kim, J. Y.; Yoon, S. R.; Jung, K. I.; The effect of bedside exercise program on stroke patients with Dysphagia; Ann Rehabil Med; 2012; vol. 36 (no. 4); 512-20

Study details

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

Study setting	Inpatients.
Study dates	Between 2009 and 2010.
Sources of funding	No additional information.
Inclusion criteria	People who had an onset of stroke within 6 months; whose dysphagia was confirmed by VFSS; who was capable of communication and had fairly good understanding; who can follow instructions, which consisted with at least one step.
Exclusion criteria	Any people with a previous history of other disease, which may have caused dysphagia; who had severe cognitive disorder, such as dementia; who cannot carry out video fluoroscopy due to incapability of sitting posture; who was not able to follow study instructions.
Recruitment / selection of participants	People hospitalised at the rehabilitation department of the hospital between 2009 and 2010.
Intervention(s)	Occupational therapy - >1-2 hours, 5 days a week N=25 Additional bedside exercise training, which consisted of oral, pharyngeal, laryngeal and respiratory exercises, 1 hour per day for 2 months and instruction regarding this program through a nursing intervention. The needs of an additional exercise to improve the inadequate stage of swallowing were explained to the person and their caregivers. The oral exercises included lips, tongue and jaw exercises and the oral pharnygeal exercise included tongue movement, including pulling and reaching soft palate with the tip and soft palate exercise, such as yawning and straw blowing, as well as the Shaker exercise. Laryngeal exercises included airway closure, vocal cord adduction and breathing exercises. Respiration exercise to facilitate swallowing, effortful swallowing and supraglottis swallowing. Rehabilitation specialists and occupational therapists provided training to nurses to aid in this. Concomitant therapy: Both groups visited the occupational therapy room for 30 minutes a day, 5 days a week for 2 months to carry out a tactile-thermal stimulation.

Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Swallow
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - <45 minutes, 5 days a week N=25 Usual care only. Concomitant therapy: Both groups visited the occupational therapy room for 30 minutes a day, 5 days a week for 2 months to carry out a tactile-thermal stimulation.
Number of participants	50
Duration of follow-up	2 months
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Individual therapy Hospital care Supervision
Additional comments	Intention to treat (no dropout).

Study arms

Occupational therapy - >1-2 hours, 5 days a week (N = 25)
Additional bedside exercise training, which consisted of oral, pharyngeal, laryngeal and respiratory exercises, 1 hour per day for 2 months and instruction regarding this program through a nursing intervention. The needs of an additional exercise to improve the inadequate stage of swallowing were explained to the person and their caregivers. The oral exercises included lips, tongue and jaw exercises and the oral pharnygeal exercise included tongue movement, including pulling and reaching soft palate with the tip and soft palate exercise, such as yawning and straw blowing, as well as the Shaker exercise. Laryngeal exercises included airway closure, vocal cord adduction and breathing exercises. Respiration exercise to facilitate swallowing, effortful swallowing and supraglottis swallowing. Rehabilitation specialists and occupational therapists provided training to nurses to aid in this. Concomitant therapy: Both groups visited the occupational therapy room for 30 minutes a day, 5 days a week for 2 months to carry out a tactile-thermal stimulation.

Occupational therapy - <45 minutes, 5 days a week (N = 25)
Usual care only. Concomitant therapy: Both groups visited the occupational therapy room for 30 minutes a day, 5 days a week for 2 months to carry out a tactile-thermal stimulation.

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - >1-2 hours, 5 days a week (N = 25)**	**Occupational therapy - <45 minutes, 5 days a week (N = 25)**
% Female Sample size	n = 9 ; % = 36	n = 7 ; % = 28
Mean age (SD) (years)	68.3 (6.6)	66.7 (6.01)

Characteristic	Occupational therapy - >1-2 hours, 5 days a week (N = 25)	Occupational therapy - <45 minutes, 5 days a week (N = 25)
Mean (SD)		
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	NR (NR)	NR (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 2 month (End of intervention)

Continuous outcomes

Outcome	Occupational therapy - >1-2 hours, 5 days a week, Baseline, N = 25	Occupational therapy - >1-2 hours, 5 days a week, 2 month, N = 25	Occupational therapy - <45 minutes, 5 days a week, Baseline, N = 25	Occupational therapy - <45 minutes, 5 days a week, 2 month, N = 25
Person/participant quality of life (Stroke-specific quality of life) Scale range: 49-245. Final values. Mean (SD)	125.5 (31.4)	147.7 (22.9)	129.8 (20.1)	144.5 (24.7)
Swallow function and ability (Functional Oral Intake Scale) Scale range: 1-7. Final values. Mean (SD)	2.8 (1.4)	4.6 (1)	2.6 (1.5)	3.6 (1.2)
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	68.4 (9.3)	74.2 (7.5)	67.7 (10.9)	72.9 (9.9)
Psychological distress - Depression (Beck Depression Inventory) Scale range: 0-63. Final values. Mean (SD)	31.5 (5.8)	26.8 (6)	30 (5.7)	29.2 (4.2)

Person/participant quality of life (Stroke-specific quality of life) - Polarity - Higher values are better

Swallow function and ability (Functional Oral Intake Scale) - Polarity - Higher values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better
Psychological distress - Depression (Beck Depression Inventory) - Polarity - Lower values are better

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

Continuousoutcomes-Person/participantqualityoflife(Stroke-specificqualityoflife)-MeanSD-Occupational therapy - >1-2 hours, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t2

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

Continuousoutcomes-Swallowfunctionandability(FunctionalOralIntakeScale)-MeanSD-Occupational therapy - >1-2 hours, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t2

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

Continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >1-2 hours, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t2

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

Continuousoutcomes-Psychologicaldistress-Depression(BeckDepressionInventory)-MeanSD-Occupational therapy - >1-2 hours, 5 days a week-Occupational therapy - <45 minutes, 5 days a week-t2

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

Kesav, 2017

Bibliographic Reference	Kesav, P.; Vrinda, S. L.; Sukumaran, S.; Sarma, P. S.; Sylaja, P. N.; Effectiveness of speech language therapy either alone or with add-on computer-based language therapy software (Malayalam version) for early post stroke aphasia: A feasibility study; Journal of the Neurological Sciences; 2017; vol. 380; 137-141

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	Clinical Trials Registry India 2016/08/012021
Study type	Randomised controlled trial (RCT)
Study location	India
Study setting	The Comprehensive Stroke Care Center of a tertiary health care institute situated in South India
Study dates	September 2013 to January 2016
Sources of funding	Centre for Disability Studies, Government of India (CeDS/FA/2011-2012) [Clinical Trials Registry India 2016/08/012021].
Inclusion criteria	Right handed subjects; aged 15 years or above; should present for evaluation within 3 months of suffering the first ever episode of ischaemic stroke in the middle cerebral artery (defined on CT scan or MRI scan); either either Anomic, Broca's, Wernicke's, Transcortical motor/sensory aphasia or Conduction aphasia with a Western Aphasia Battery score of <93.8 on initial assessment.
Exclusion criteria	Brainstem stroke; bilateral strokes; haemorrhagic stroke; cognitive impairment (MMSE score below 24); unstable cardiopulmonary status/other diseases likely to hamper the four weeks follow up and those who could not speak/ready/write Malayalam premorbidly.
Recruitment / selection of participants	Consecutive patients at the Comprehensive Stroke Care Center of SCTIMST, Trivandrum, India.

Intervention(s)	Speech and Language Therapy - >1 to 2 hours, <5 days a week N=12 Computer based language therapy along with conventional speech and language therapy delivered by a qualified speech/language pathologist. The computer based programs used the software 'MOZHI' and used hexarchial modules including: 1) auditory verbal comprehension; 2) expression of language assessment, 3) naming, 4) writing, 5) reading, 6) calculation. All the recruited subjects received a total of 12 therapy sessions of 1 hour each over a period of 4 weeks on a thrice weekly basis individually supervised by the speech and language pathologists, whereas those randomised to the computer based language rehabilitation arm received an additional 1 hour per session. Concomitant therapy: Conventional speech and language therapy used techniques employed for fluent aphasics including 'deblocking', 'supported communication', 'promoting aphasics communicative effectiveness therapy' and 'word fluency exercises', whereas those with non-fluent aphasics included 'melodic intonation therapy' aimed at the melodic pattern of the recited words , 'multiple input phoneme therapy' in order to break the apraxia component of aphasics, 'prolongation techniques' for improving the fluency, 'PACE therapy' to improve the naming skills, 'word fluency exercises' and 'picture description' as well as 'narration tasks' in order to improve the fluency. The techniques for improving reading as well as writing skills comprised of 'alphabet identification and naming' followed by phone-grapheme correlation, 'unison reading' with speech and language pathologists and 'letter by letter reading'.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Mixed
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week N=12 Conventional speech and language therapy only (12 therapy sessions of 1 hour each over a period of 4 weeks). Concomitant therapy: Conventional speech and language therapy used techniques employed for fluent aphasics including 'deblocking', 'supported communication', 'promoting aphasics communicative effectiveness therapy' and 'word fluency exercises', whereas those with non-fluent aphasics included 'melodic intonation therapy' aimed at the melodic pattern of the

	recited words , 'multiple input phoneme therapy' in order to break the apraxia component of aphasics, 'prolongation techniques' for improving the fluency, 'PACE therapy' to improve the naming skills, 'word fluency exercises' and 'picture description' as well as 'narration tasks' in order to improve the fluency. The techniques for improving reading as well as writing skills comprised of 'alphabet identification and naming' followed by phone-grapheme correlation, 'unison reading' with speech and language pathologists and 'letter by letter reading'.
Number of participants	24
Duration of follow-up	4 weeks (end of intervention) and 12 weeks (<6 months)
Indirectness	No additional information
Elements of the study relating to qualitative themes	People with communication difficulties Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information

Study arms

Speech and Language Therapy - >1 to 2 hours, <5 days a week (N = 12)
Computer based language therapy along with conventional speech and language therapy delivered by a qualified speech/language pathologist. The computer based programs used the software 'MOZHI' and used hexarchial modules including: 1) auditory verbal comprehension; 2) expression of language assessment, 3) naming, 4) writing, 5) reading, 6) calculation. All the recruited subjects received a total of 12 therapy sessions of 1 hour each over a period of 4 weeks on a thrice weekly basis individually supervised by the speech and language pathologists, whereas those randomised to the computer based language rehabilitation arm received an additional 1 hour per session. Concomitant therapy: Conventional speech and language therapy used techniques employed for fluent aphasics including 'deblocking', 'supported communication', 'promoting aphasics communicative effectiveness therapy' and 'word fluency exercises', whereas those with non-fluent aphasics included 'melodic intonation therapy' aimed at the melodic pattern of the recited words , 'multiple input phoneme therapy' in order to break the apraxia component of aphasics, 'prolongation techniques' for improving the fluency, 'PACE therapy' to improve the naming skills, 'word fluency exercises' and 'picture description' as well as 'narration tasks' in order to improve the fluency. The techniques for improving reading as well as writing skills comprised of 'alphabet identification and naming' followed by phone-grapheme correlation, 'unison reading' with speech and language pathologists and 'letter by letter reading'.

Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week (N = 12)
Conventional speech and language therapy only (12 therapy sessions of 1 hour each over a period of 4 weeks). Concomitant therapy: Conventional speech and language therapy used techniques employed for fluent aphasics including 'deblocking', 'supported communication', 'promoting aphasics communicative effectiveness therapy' and 'word fluency exercises', whereas those with non-fluent aphasics included 'melodic intonation therapy' aimed at the melodic pattern of the recited words , 'multiple input phoneme therapy' in order to break the apraxia component of aphasics, 'prolongation techniques' for improving the fluency, 'PACE therapy' to improve the naming skills, 'word fluency exercises' and 'picture description' as well as 'narration tasks' in order to improve the fluency. The techniques for improving reading as well as writing skills comprised of 'alphabet identification and naming' followed by phone-grapheme correlation, 'unison reading' with speech and language pathologists and 'letter by letter reading'.

Characteristics

Arm-level characteristics

Characteristic	Speech and Language Therapy - >1 to 2 hours, <5 days a week (N = 12)	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week (N = 12)
% Female Sample size	n = 5 ; % = 45	n = 2 ; % = 22
Mean age (SD) (years) Mean (SD)	56.27 (11.62)	48.67 (11.83)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Mean (SD)	12.8 (6.35)	10.1 (3.95)
Time period since stroke (days) Mean (SD)	31.2 (31)	29.3 (30)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)

Speech and Language Therapy - >1 to 2 hours, <5 days a week compared to Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week at <6 months - continuous outcome

Outcome	Speech and Language Therapy - >1 to 2 hours, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >1 to 2 hours, <5 days a week, 12 week, N = 11	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, 12 week, N = 9
Communication - Western Aphasia Battery Aphasia Quotient Scale range: 0-100. Final values. Mean (SD)	45.1 (28.4)	67.6 (32.7)	32.4 (25.8)	73.3 (26.9)

Communication - Western Aphasia Battery Aphasia Quotient - Polarity - Higher values are better

Speech and Language Therapy - >1 to 2 hours, <5 days a week compared to Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week at <6 months - dichotomous outcome

Outcome	Speech and Language Therapy - >1 to 2 hours, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >1 to 2 hours, <5 days a week, 12 week, N = 12	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, 12 week, N = 12
Discontinuation Only provided reasons overall:	n = NA ; % = NA	n = 1 ; % = 8	n = NA ; % = NA	n = 3 ; % = 25

Outcome	Speech and Language Therapy - >1 to 2 hours, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >1 to 2 hours, <5 days a week, 12 week, N = 12	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 12	Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week, 12 week, N = 12
2 expired before completing the study, 2 withdrew consent No of events				

Discontinuation - Polarity - Lower values are better

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

SpeechandLanguageTherapy->1to2hours,<5daysaweekcomparedtoSpeechandLanguageTherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Communication-WesternAphasiaBatteryAphasiaQuotient-MeanSD-Speech and Language Therapy - >1 to 2 hours, <5 days a week-Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week-t12

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

SpeechandLanguageTherapy->1to2hours,<5daysaweekcomparedtoSpeechandLanguageTherapy->45minutesto1hour,<5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language Therapy - >1 to 2 hours, <5 days a week-Speech and Language Therapy - >45 minutes to 1 hour, <5 days a week-t12

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

Khan, 2011

Bibliographic Reference	Khan, C. M.; Oesch, P. R.; Gamper, U. N.; Kool, J. P.; Beer, S.; Potential effectiveness of three different treatment approaches to improve minimal to moderate arm and hand function after stroke--a pilot randomized clinical trial; Clinical rehabilitation; 2011; vol. 25 (no. 11); 1032-1041

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Switzerland
Study setting	People at the Neurorehabilitation Center Valens, Switzerland
Study dates	May 2006 and April 2008
Sources of funding	This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
Inclusion criteria	People with acute, subacute and chronic stroke referred for inpatient rehabilitation; improvement of arm and hand function as the primary rehabilitation goal; minimal to moderate arm and hand function (stage 2-6 on the Chedoke-McMaster Impairment Inventory subscale shoulder pain at least stage 5); capable of walking a minimum of 20m with assistance or walking aids; capable of understanding treatment instructions and providing informed consent; written informed consent.
Exclusion criteria	Other neurological disorder; other serious comorbidities
Recruitment / selection of participants	People referred for inpatient rehabilitation
Intervention(s)	Multidisciplinary team - >4 hours, 5 days a week N=14 Constraint induced therapy (2.5 hours of physiotherapy and occupational therapy, and 5 hours of group therapy) in addition to 5 hours of self training (30 minutes after each physiotherapy and occupational therapy session) per week and usual care. The 5 hours of group therapy consisted of specific arm and hand function training with individual task-oriented exercises. To enable people with minimal function to perform their task-oriented exercises, adaptations such as hand fixation with a bandage to the object, use of magnets or hooks attached to objects to imitate grasping activities while enhancing shoulder and elbow movements, or choice of positions requiring less strain against gravity were used. Participants trained their arm and hand function while washing, grooming and eating with assistance. Self-training included continued repetitive task-

	oriented training. During the therapies participants wore a constraining mitt, and they were also encouraged to wear it outside the sessions depending on their function skills. Concomitant therapy: Conventional neurological therapy included individual physiotherapy (5 hours) and occupational therapy (2.5 hours) per week, including postural control during task performance, inhibition of uneconomic and therefore ineffective synergistic movements and facilitation of economic movements to relearn efficient movement strategies for functional task performance. In addition, participants received general activation in a group setting for 5 hours per week and, depending on their motor skills, either 3 hours of garden group or wood-workshop group or 2 hours of fine motor dexterity group. If required, patients were instructed or assisted while washing and grooming in the morning and while eating with the affected hand. total treatment time was 15-20 hours per week.
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Multidisciplinary team - >2 to 4 hours, 5 days a week N=30 Two groups, the convention therapy (n=15) group (receiving just usual care), and therapeutic climbing (n=15) group (receiving the same amount of care as usual care, but including a treatment protocol and the same amount of therapies as the conventional neurological therapy group except that at least 80% of the individual physiotherapy sessions consisted of climbing-specific exercises performed at the climbing wall inside the clinic. This was adapted to the persons needs (using different holds, reach, different sized grips, leaning or pushing to pin small objects to the wall with either hand and maintaining the position of the other hand). Concomitant therapy: Conventional neurological therapy included individual physiotherapy (5 hours) and occupational therapy (2.5 hours) per week, including postural control during task performance, inhibition of uneconomic and therefore ineffective synergistic movements and facilitation of economic movements to relearn efficient movement strategies for functional task performance. In addition, participants received general activation in a group setting for 5 hours per week

	and, depending on their motor skills, either 3 hours of garden group or wood-workshop group or 2 hours of fine motor dexterity group. If required, patients were instructed or assisted while washing and grooming in the morning and while eating with the affected hand. total treatment time was 15-20 hours per week.
Number of participants	44
Duration of follow-up	6 months (discharge = end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy and group-based therapy 'Homework'/self management interventions Physical environment - the climbing intervention requires space for a climbing wall Variety in activities and choice - provides choices of gardening and woodwork activities for usual care
Additional comments	Method of analysis unclear. Does not appear to be intention to treat.

Study arms

Multidisciplinary team - >4 hours, 5 days a week (N = 14)
Constraint induced therapy (2.5 hours of physiotherapy and occupational therapy, and 5 hours of group therapy) in addition to 5 hours of self training (30 minutes after each physiotherapy and occupational therapy session) per week and usual care. The 5 hours of group

therapy consisted of specific arm and hand function training with individual task-oriented exercises. To enable people with minimal function to perform their task-oriented exercises, adaptations such as hand fixation with a bandage to the object, use of magnets or hooks attached to objects to imitate grasping activities while enhancing shoulder and elbow movements, or choice of positions requiring less strain against gravity were used. Participants trained their arm and hand function while washing, grooming and eating with assistance. Self-training included continued repetitive task-oriented training. During the therapies participants wore a constraining mitt, and they were also encouraged to wear it outside the sessions depending on their function skills. Concomitant therapy: Conventional neurological therapy included individual physiotherapy (5 hours) and occupational therapy (2.5 hours) per week, including postural control during task performance, inhibition of uneconomic and therefore ineffective synergistic movements and facilitation of economic movements to relearn efficient movement strategies for functional task performance. In addition, participants received general activation in a group setting for 5 hours per week and, depending on their motor skills, either 3 hours of garden group or wood-workshop group or 2 hours of fine motor dexterity group. If required, patients were instructed or assisted while washing and grooming in the morning and while eating with the affected hand. total treatment time was 15-20 hours per week.

Multidisciplinary team - >2 to 4 hours, 5 days a week (N = 30)

Two groups, the convention therapy (n=15) group (receiving just usual care), and therapeutic climbing (n=15) group (receiving the same amount of care as usual care, but including a treatment protocol and the same amount of therapies as the conventional neurological therapy group except that at least 80% of the individual physiotherapy sessions consisted of climbing-specific exercises performed at the climbing wall inside the clinic. This was adapted to the persons needs (using different holds, reach, different sized grips, leaning or pushing to pin small objects to the wall with either hand and maintaining the position of the other hand). Concomitant therapy: Conventional neurological therapy included individual physiotherapy (5 hours) and occupational therapy (2.5 hours) per week, including postural control during task performance, inhibition of uneconomic and therefore ineffective synergistic movements and facilitation of economic movements to relearn efficient movement strategies for functional task performance. In addition, participants received general activation in a group setting for 5 hours per week and, depending on their motor skills, either 3 hours of garden group or wood-workshop group or 2 hours of fine motor dexterity group. If required, patients were instructed or assisted while washing and grooming in the morning and while eating with the affected hand. total treatment time was 15-20 hours per week.

Characteristics

Arm-level characteristics

Characteristic	Multidisciplinary team - >4 hours, 5 days a week (N = 14)	Multidisciplinary team - >2 to 4 hours, 5 days a week (N = 30)
% Female Sample size	n = 3 ; % = 23	n = 8 ; % = 28
Mean age (SD) (years) Mean (SD)	60.4 (16.1)	61.3 (14.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity European Stroke Scale (0-100) Mean (SD)	69.9 (8.6)	71.1 (12)
Time period since stroke (Months) Mean (SD)	5.2 (10.9)	13.3 (32.1)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (Discharge (occurred on average around 30 days for the different intervention groups). <6 months)
- 6 month (≥6 months)

Multidisciplinary team - >4 hours, 5 days a week compared to Multidisciplinary team - >2 to 4 hours, 5 days a week at <6 months and ≥6 months - continuous outcome

Outcome	Multidisciplinary team - >4 hours, 5 days a week, Baseline, N = 14	Multidisciplinary team - >4 hours, 5 days a week, 4 week, N = 13	Multidisciplinary team - >4 hours, 5 days a week, 6 month, N = 13	Multidisciplinary team - >2 to 4 hours, 5 days a week, Baseline, N = 30	Multidisciplinary team - >2 to 4 hours, 5 days a week, 4 week, N = 29	Multidisciplinary team - >2 to 4 hours, 5 days a week, 6 month, N = 26
Physical function - upper limb (Wolf Motor Function Test time) (seconds) Scale range: 0-120. Final values. Mean (SD)	64.5 (38.4)	33 (34.7)	27.9 (29.1)	54.8 (42.6)	34.4 (42.6)	33 (44.1)

Physical function - upper limb (Wolf Motor Function Test time) - Polarity - Lower values are better

Multidisciplinary team - >4 hours, 5 days a week compared to Multidisciplinary team - >2 to 4 hours, 5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Multidisciplinary team - >4 hours, 5 days a week, Baseline, N = 14	Multidisciplinary team - >4 hours, 5 days a week, 4 week, N = 14	Multidisciplinary team - >4 hours, 5 days a week, 6 month, N = 14	Multidisciplinary team - >2 to 4 hours, 5 days a week, Baseline, N = 30	Multidisciplinary team - >2 to 4 hours, 5 days a week, 4 week, N = 30	Multidisciplinary team - >2 to 4 hours, 5 days a week, 6 month, N = 30
Discontinuation Intervention: 1 drop out (homesickness). Control: 1 drop out in conventional neurological therapy group (thrombosis), 3 drop outs in therapeutic climbing group (1 died, 1 suffered another stroke, 1 refused to turn up). No of events	n = NA ; % = NA	n = 1 ; % = 7	n = 1 ; % = 7	n = NA ; % = NA	n = 1 ; % = 3	n = 4 ; % = 13

Discontinuation - Polarity - Lower values are better

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

Multidisciplinaryteam->4hours,5daysaweekcomparedtoMultidisciplinaryteam->2to4hours,5daysaweekat≥6months-continuousoutcome-Physicalfunction-upperlimb(WolfMotorFunctionTesttime)-MeanSD-Multidisciplinary team - >4 hours, 5 days a week-Multidisciplinary team - >2 to 4 hours, 5 days a week-t4

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

Multidisciplinaryteam->4hours,5daysaweekcomparedtoMultidisciplinaryteam->2to4hours,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Multidisciplinary team - >4 hours, 5 days a week-Multidisciplinary team - >2 to 4 hours, 5 days a week-t4

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

Multidisciplinaryteam->4hours,5daysaweekcomparedtoMultidisciplinaryteam->2to4hours,5daysaweekat<6monthsand≥6months-continuousoutcome-Physicalfunction-upperlimb(WolfMotorFunctionTesttime)-MeanSD-Multidisciplinary team - >4 hours, 5 days a week-Multidisciplinary team - >2 to 4 hours, 5 days a week-t6

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

Multidisciplinaryteam->4hours,5daysaweekcomparedtoMultidisciplinaryteam->2to4hours,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Multidisciplinary team - >4 hours, 5 days a week-Multidisciplinary team - >2 to 4 hours, 5 days a week-t6

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

Kim, 2012

Bibliographic Reference	Kim, Bh; Lee, Sm; Bae, Yh; Yu, Jh; Kim, Th; The effect of a task-oriented training on trunk control ability, balance and gait of stroke patients; Journal of Physical Therapy Science; 2012; vol. 24 (no. 6); 519-22.

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Hospital
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	Ability to walk 10m independently using an aid or orthotic with or without supervision or aid, and a minimum score of 20 in the Korean Mini-Mental State Examination (K-MMSE).
Exclusion criteria	Joint contraction; pain or fracture of the musculoskeletal system; hemianopsia.
Recruitment / selection of participants	No additional information
Intervention(s)	Occupational therapy - >1 to 2 hours, 5 days a week N=10 Task-oriented training for 1 hour per day, 3 days a week, for 4 weeks. This was a standardized program supervised by a physical or occupational therapist. It consisted of 10 walking-related tasks designed to strengthen the lower extremities and enhance the walking balance, speed and distance in a progressive manner. The 10 tasks were: step-ups, balance beam, kicking a ball, stand up and walk, obstacle course, treadmill, walk and carry, speed walk, walk backwards and stairs. The subjects warmed up for 5 minutes to improve their range of motion and flexibility. Each item was practiced for 5 minutes, with 1 minute of rest time allowed between each item.

	Concomitant therapy: Consecutive physical therapy for 1 hour per day, 5 days a week for 4 weeks. Conservative physical therapy consisted of joint mobilization, muscle strengthening and balance training.
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - >45 minutes to 1 hour, 5 days a week N=10 Conventional physical therapy only. Concomitant therapy: Consecutive physical therapy for 1 hour per day, 5 days a week for 4 weeks. Conservative physical therapy consisted of joint mobilization, muscle strengthening and balance training.
Number of participants	20
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care

Additional comments	No information about the method of analysis. No discontinuation?

Study arms

Occupational therapy - >1 to 2 hours, 5 days a week (N = 10)
Task-oriented training for 1 hour per day, 3 days a week, for 4 weeks. This was a standardized program supervised by a physical or occupational therapist. It consisted of 10 walking-related tasks designed to strengthen the lower extremities and enhance the walking balance, speed and distance in a progressive manner. The 10 tasks were: step-ups, balance beam, kicking a ball, stand up and walk, obstacle course, treadmill, walk and carry, speed walk, walk backwards and stairs. The subjects warmed up for 5 minutes to improve their range of motion and flexibility. Each item was practiced for 5 minutes, with 1 minute of rest time allowed between each item. Concomitant therapy: Consecutive physical therapy for 1 hour per day, 5 days a week for 4 weeks. Conservative physical therapy consisted of joint mobilization, muscle strengthening and balance training.

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 10)
Conventional physical therapy only. Concomitant therapy: Consecutive physical therapy for 1 hour per day, 5 days a week for 4 weeks. Conservative physical therapy consisted of joint mobilization, muscle strengthening and balance training.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 10)	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 10)
% Female Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 10)	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 10)
Mean age (SD) (years) Mean (SD)	52.5 (11.72)	53.4 (12.11)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (years) Mean (SD)	7.7 (6.11)	13.1 (10.62)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcome

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 10	Occupational therapy - >1 to 2 hours, 5 days a week, 4 week, N = 10	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 10	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 10
Physical function - lower limb (Berg Balance Scale) Scale range: 0-55. Final values. Mean (SD)	43.2 (5.05)	50.1 (4.12)	42.1 (10.89)	44.6 (10.17)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

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

Occupational therapy ->1to2hours,5daysaweekcomparedtoOccupational therapy ->45minutesto1hour,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t4

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

Kim, 2015

Bibliographic Reference	Kim, C. Y.; Lee, J. S.; Kim, H. D.; Kim, J.; Lee, I. H.; Lower extremity muscle activation and function in progressive task-oriented training on the supplementary tilt table during stepping-like movements in patients with acute stroke hemiparesis; Journal of electromyography and kinesiology; 2015; vol. 25 (no. 3); 522-530

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	People at the stroke rehabilitation institute
Study dates	No additional information
Sources of funding	No additional information

Inclusion criteria	They had stable haemodynamics in the absence of significant lower limb spasticity (with Ashworth index <2 in all of the lower limb muscles: average 0.9 ± 0.6 [mean ± SD]) and absence of significant cardiovascular impairment; an ischaemic or haemorrhagic post-stroke hemiparesis; at least 26 on the modified mini-mental status examination Korea version; stable medical condition allowing participation in the experimental procedures and intervention.
Exclusion criteria	Cardiac arrhythmia; thrombophlebitis; significant perceptual, cognitive or communication impairments; diabetes; unilateral neglect; contraindication to tilt table and surface electromyography (cancer, pacemaker, unstable epilepsy or skin abnormalities).
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 hour to 2 hours, 5 days a week N=26 Two groups. Tilt table group (n=13) and task-oriented training group on the tilt table (n=13) for an additional 20 minutes per day while they were positioned such that they felt comfortable at a tilt angle. The two groups received training on the following tilt table applications: tilt table only group were strapped by safety thoracic, pelvic and both knee belts; task-oriented training group progressively performed task-oriented training such as one-leg standing or target-matched reaching, and kick a ball exercises with the less-affected lower extremity. At first, subjects in that group stood and leant against the tilt table with their trunk restrained to prevent compensatory trunk movement. Corrective feedback was given if compensatory movements were observed. Other tasks were also used to minimize compensatory movements. The subjects then started with an easy task, such as one-leg standing or closer target-matched reaching, and kicking light load training. As they completed the easy task perfectly, they were allowed to perform increasingly difficult tasks, such as far target-matched reaching and kicking heavy load training. The therapist also determined the task level of each subject on the basis of the principle of progressive load. For the target-matched reaching and kicking a ball training, familiar objects such as plastic balls were used that varied in size, shape and weight (56-453g). They were only allowed to reach and kick in the sagittal plane of the anterior-posterior direction. Training intensity was determined depending on the response of each subject, and training involved only the less-affected limb. Instructions were to move at a preferred speed and to increase that speed as training progressed. The subjects in the group performed a total of 5 sets, with 10 repetitions in a set. After each set, a one-minute resting time was allowed. The angle of the tilt table measured between the surface of the table and horizontal was varied from 0 to 90 degrees. During the 20-minute phase of the intervention, all people were placed in the supine position on the tilt table and to reduce their tilt angle during a session if they felt light headed. If they experienced dizziness or nausea during the experimental procedures, we immediately stopped the experiment, and the subjects were allowed to rest

	in the supine position. Furthermore, they used a therapeutic foam roller (length 60cm, width 15cm) to prevent knee hyper-extension in the subjects. Concomitant therapy: Routine therapy for 50 minutes, five times a week.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Functional independency

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=13 Routine therapy only Concomitant therapy: Routine therapy for 50 minutes, five times a week.
Number of participants	39
Duration of follow-up	3 weeks (end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors Individual therapy Provision of feedback - feedback was provided while people were exercising if they used coping strategies Environmental factors Hospital care Use of expensive equipment - tilt table
Additional comments	ITT no people discontinued the study

Study arms

Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 26)
Two groups. Tilt table group (n=13) and task-oriented training group on the tilt table (n=13) for an additional 20 minutes per day while they were positioned such that they felt comfortable at a tilt angle. The two groups received training on the following tilt table applications: tilt table only group were strapped by safety thoracic, pelvic and both knee belts; task-oriented training group progressively performed task-oriented training such as one-leg standing or target-matched reaching, and kick a ball exercises with the less-affected lower extremity. At first, subjects in that group stood and leant against the tilt table with their trunk restrained to prevent compensatory trunk movement. Corrective feedback was given if compensatory movements were observed. Other tasks were also used to minimize compensatory movements. The subjects then started with an easy task, such as one-leg standing or closer target-matched reaching, and kicking light load training. As they completed the easy task perfectly, they were allowed to perform increasingly difficult tasks, such as far target-matched reaching and kicking heavy load training. The therapist also determined the task level of

each subject on the basis of the principle of progressive load. For the target-matched reaching and kicking a ball training, familiar objects such as plastic balls were used that varied in size, shape and weight (56-453g). They were only allowed to reach and kick in the sagittal plane of the anterior-posterior direction. Training intensity was determined depending on the response of each subject, and training involved only the less-affected limb. Instructions were to move at a preferred speed and to increase that speed as training progressed. The subjects in the group performed a total of 5 sets, with 10 repetitions in a set. After each set, a one-minute resting time was allowed. The angle of the tilt table measured between the surface of the table and horizontal was varied from 0 to 90 degrees. During the 20-minute phase of the intervention, all people were placed in the supine position on the tilt table and to reduce their tilt angle during a session if they felt light headed. If they experienced dizziness or nausea during the experimental procedures, we immediately stopped the experiment, and the subjects were allowed to rest in the supine position. Furthermore, they used a therapeutic foam roller (length 60cm, width 15cm) to prevent knee hyper-extension in the subjects. Concomitant therapy: Routine therapy for 50 minutes, five times a week.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Routine therapy only Concomitant therapy: Routine therapy for 50 minutes, five times a week.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 26)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)**
% Female Sample size	n = 15 ; % = 58	n = 6 ; % = 46
Mean age (SD) (years) Mean (SD)	60.37 (8.82)	58.54 (11.73)
Ethnicity	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 26)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Sample size		
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity (NIHSS) Mean (SD)	9.44 (2.11)	9.21 (2.41)
Time period since stroke (days) Mean (SD)	27.06 (5.28)	23.71 (3.85)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 week (<6 months)

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 26	Physiotherapy - >1 hour to 2 hours, 5 days a week, 3 week, N = 26	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 3 week, N = 13
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	17 (2.05)	73.64 (7.84)	16.91 (1.77)	19.27 (5.97)
Physical function - lower limb (Fugl Meyer Scale) Scale range: 0-34. Final values. Mean (SD)	10.5 (1.54)	25.13 (3.65)	9.28 (1.16)	11.17 (1.78)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - lower limb (Fugl Meyer Scale) - Polarity - Higher values are better

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 26	Physiotherapy - >1 hour to 2 hours, 5 days a week, 3 week, N = 26	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 3 week, N = 13
Discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(FuglMeyerScale)-MeanSD-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Kim, 2022

Bibliographic Reference	Kim, H; Kim, J; Jo, S; Lee, K; Kim, J; Song, C; Video augmented mirror therapy for upper extremity rehabilitation after stroke: a randomized controlled trial; Journal of neurology; 2022

Study details

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

Trial name / registration number	KCT0003047
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Outpatient follow up.
Study dates	October to December 2017.
Sources of funding	This research was supported by a grant of the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI), funded by the Ministry of Health & Welfare, Republic of Korea (grant number: HI21C0572).
Inclusion criteria	First stroke with hemiplegia during the previous 12 months; ability to understand and follow simple verbal instructions; Korean version of the Mini-mental State Examination score at least 21 points; mild to moderate motor impairment (total FMA upper extremity scores of 26-56).
Exclusion criteria	Psychiatric disorders of dementia; orthopedic disorders; apraxia or hemineglect; people with previous experience of mirror therapy.
Recruitment / selection of participants	Recruited from the N hospital in Gyeonggi-do by publicizing the research purpose and inclusion criteria.
Intervention(s)	Physiotherapy - >1-2 hours, 5 days a week N=28 Two groups combined, both providing therapy for 30 minutes/day, 5 times a week for 4 weeks in addition to usual care. One group (n=14) received mirror therapy through a video augmented wearable reflection device, one group (n=14) received traditional mirror therapy. The video augmented mirror therapy group received mirror therapy with the use of a device equipped with a tablet personal computer on top of four wheels at the bottom to enable people to easily move their affected arm. Before starting therapy people were video recorded while performing 11 tasks. The captured images were left-right reversed to create an image of the affected upper extremity. The therapists explained the procedure prior to each task. Participants were asked to move their affected upper extremities simultaneously while watching the image of the produced

	program so they could experience visual illusions in which they might thick the hands on the screen were their actual hands. The tasks consisted of 11 movements followed by a brief explanation of the therapy process for first 5 minutes. Each operation was repeated 20 times. The traditional mirror therapy group underwent the same exercises but using a mirror between the arms instead of a tablet PC. People were seated in a chair or a wheelchair with a mirror placed vertically on the table in front of them. The unaffected arm was placed in front of the mirror while the unaffected arm was placed behind them. Otherwise the procedure was the same. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes-1 hour, 5 days a week N=14 Usual care only. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.
Number of participants	42

Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Individual therapy Telerehabilitation, assistive technology and computer-based tools Use of expensive/additional equipment Hospital care Supervision - Supervision required for the procedure
Additional comments	Method of analysis unclear. Appears to be completers only.

Study arms

Physiotherapy - >1-2 hours, 5 days a week (N = 28)
Two groups combined, both providing therapy for 30 minutes/day, 5 times a week for 4 weeks in addition to usual care. One group (n=14) received mirror therapy through a video augmented wearable reflection device, one group (n=14) received traditional mirror therapy. The video augmented mirror therapy group received mirror therapy with the use of a device equipped with a tablet personal computer on top of four wheels at the bottom to enable people to easily move their affected arm. Before starting therapy people were video recorded while performing 11 tasks. The captured images were left-right reversed to create an image of the affected upper extremity. The therapists explained the procedure prior to each task. Participants were asked to move their affected upper extremities simultaneously while watching the image of the produced program so they could experience visual illusions in which they might thick the hands on the screen were their actual hands. The tasks consisted of 11 movements followed by a brief explanation of the therapy process for first 5 minutes. Each operation was repeated 20 times. The traditional mirror therapy group underwent the same exercises but using a mirror between the arms instead of a tablet PC. People were seated in a chair or a wheelchair with a mirror placed

vertically on the table in front of them. The unaffected arm was placed in front of the mirror while the unaffected arm was placed behind them. Otherwise the procedure was the same. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 14)
Usual care only. Concomitant therapy: Conventional rehabilitation consisting of physical and occupational therapies. Physical therapy included neurodevelopmental therapy approaches, strengthening, balance training and gait training. Occupational therapy included task-specific repetitive functional training, strengthening and daily living activity training. Conventional rehabilitation was performed for 60 minutes/day, 5 times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1-2 hours, 5 days a week (N = 28)**	**Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 14)**
% Female Sample size	n = 9 ; % = 32	n = 4 ; % = 33
Mean age (SD) (years) Mean (SD)	60.29 (5.69)	58.75 (3.44)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1-2 hours, 5 days a week (N = 28)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 14)
Sample size		
Severity Mean (SD)	NR (NR)	NR (NR)
Time period since stroke (Months) Mean (SD)	6.88 (2.55)	6.67 (2.35)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (End of intervention)

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 24	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 12
Physical function - upper limb (Fugl Meyer Assessment Upper	NA (NA)	NA (NA)	NA (NA)	NA (NA)

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 24	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 12
Limb) Scale range: 0-66. Final values. Mean (SD)				
FMA Shoulder, elbow and forearm Scale range: 0-36. Final values. Electronic mirror therapy: 32.33 (3.80). Traditional mirror therapy: 30.25 (2.83). Mean (SD)	27.34 (4.22)	31.29 (3.51)	27.67 (4.77)	29.42 (4.87)
FMA Wrist Scale range: 0-10. Final values. Electronic mirror therapy: 7.75 (2.18). Traditional mirror therapy: 6.83 (1.85). Mean (SD)	5.42 (1.44)	7.29 (2.07)	5.33 (1.56)	6 (1.28)
FMA Hand Scale range: 0-14. Final values. Electronic mirror therapy: 9.17 (2.21). Traditional mirror therapy: 9.33 (2.35). Mean (SD)	6.92 (1.54)	9.25 (2.28)	7.25 (1.29)	8 (1.04)
FMA Coordination Scale range: 0-6. Final values.	3.04 (0.88)	3.79 (1.04)	3.25 (0.75)	3.67 (0.89)

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 24	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 12
Electronic mirror therapy: 3.75 (1.22). Traditional mirror therapy: 3.83 (0.83). Mean (SD)				

Physical function - upper limb (Fugl Meyer Assessment Upper Limb) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 28	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 28	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 14	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 14
Discontinuation from study Intervention: 2 discharged, 1 low participation, 1 refused to participate. Control: 2 discharged. No of events	n = NA ; % = NA	n = 4 ; % = 14	n = NA ; % = NA	n = 2 ; % = 14

Discontinuation from study - Polarity - Lower values are better

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

Continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperLimb)-FMAShoulder,elbowandforearm-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperLimb)-FMAWrist-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperLimb)-FMAHand-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperLimb)-FMACoordination-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Dichotomousoutcomes-Discontinuationfromstudy-NoOfEvents-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Kim, 2014

Bibliographic Reference	Kim, J.; Park, J. H.; Yim, J.; Effects of respiratory muscle and endurance training using an individualized training device on the pulmonary function and exercise capacity in stroke patients; Medical Science Monitor; 2014; vol. 20; 2543-9

Study details

Secondary publication of another included	No additional information

study- see primary study for details	
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Inpatient
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	People who had experienced the first episode of unilateral stroke with hemiparesis during the previous 6 months and were capable of comprehending commands and walking for at least 6 minutes with or without the use of an assistive device
Exclusion criteria	Previous history of cardiovascular and respiratory problems; medications that would influence the metabolic or cardiorespiratory responses to exercise; regular exercise training or sports activity to strengthen ventilator muscles; bone deformities of the chest or spine.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 to 2 hours, <5 days a week N=10

	Additional individualised respiratory muscle training regimen using a respiratory exercise device for 20 minutes. The exercise was conducted with the patients biting the handle mouthpiece while sitting and looking at the main body of the RESPIFIT S. The therapist inserted a program card into the device, which was individually adjusted and set to the breathing capacity of each patient. The therapist inserted a program card into the device, which was individually adjusted and set to the breathing capacity of each patient. The therapist operated the main body to initiate the respiratory muscle training or endurance training, which was displayed like a game on the main screen. At the midpoint of the breathing exercises, if the patient felt fatigued or dizzy, a rest was permitted before resuming the remainder of the exercise. Prior to the test, the therapist trained the patients on 2 or 3 occasions to accustom them to the breathing exercise. Concomitant therapy: Exercise training intervention 3 times per week consisting of 30 minutes of basic exercise treatments, followed by an automated full-body workout for 20 minutes.
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed General exercise and respiratory muscle exercise

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, <5 days a week N=10 Conventional therapy only. Concomitant therapy: Exercise training intervention 3 times per week consisting of 30 minutes of basic exercise treatments, followed by an automated full-body workout for 20 minutes.
Number of participants	20
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No information on method of analysis. No participants appear to have been lost.

Study arms

Physiotherapy - >1 to 2 hours, <5 days a week (N = 10)
Additional individualised respiratory muscle training regimen using a respiratory exercise device for 20 minutes. The exercise was conducted with the patients biting the handle mouthpiece while sitting and looking at the main body of the RESPIFIT S. The therapist inserted a program card into the device, which was individually adjusted and set to the breathing capacity of each patient. The therapist inserted a program card into the device, which was individually adjusted and set to the breathing capacity of each patient. The therapist operated the main body to initiate the respiratory muscle training or endurance training, which was displayed like a game on the main screen. At the midpoint of the breathing exercises, if the patient felt fatigued or dizzy, a rest was permitted before resuming the remainder of the exercise. Prior to the test, the therapist trained the patients on 2 or 3 occasions to accustom them to the breathing exercise. Concomitant therapy: Exercise training intervention 3 times per week consisting of 30 minutes of basic exercise treatments, followed by an automated full-body workout for 20 minutes.

Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 10)
Conventional therapy only. Concomitant therapy: Exercise training intervention 3 times per week consisting of 30 minutes of basic exercise treatments, followed by an automated full-body workout for 20 minutes.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, <5 days a week (N = 10)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 10)
% Female Sample size	n = NR ; % = NR	n = NR ; % = NR
Mean age (SD) (years) Mean (SD)	54.1 (11.69)	53.9 (5.82)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (month) Mean (SD)	13.76 (4.02)	13.5 (2.76)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 10	Physiotherapy - >1 to 2 hours, <5 days a week, 4 week, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 4 week, N = 10
Physical function - lower limb (6-minute walk test) (meters) Change scores Mean (SD)	163.6 (63.87)	55 (56.38)	177.5 (78.39)	8.7 (9.84)

Physical function - lower limb (6-minute walk test) - Polarity - Higher values are better

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(6-minutewalktest)-MeanSD-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t4

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

Kim, 2009

Bibliographic Reference	Kim, Jh; Jang, Sh; Kim, Cs; Jung, Jh; You, Jh; Use of virtual reality to enhance balance and ambulation in chronic stroke: A double-blind, randomized controlled study; American Journal of Physical Medicine and Rehabilitation; 2009; vol. 88 (no. 9); 693-701.

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	A medical inpatient facility
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	At least 1 year after first stroke; plateau in the maximum motor recovery after a conventional neurorehabilitation; the ability to stand for 30 minutes and walk indoors independently (around 30 metres distance).
Exclusion criteria	Severe visual (i.e., visual neglect determined by the motor free visual perception test) and cognitive impairments; musculoskeletal disorders that could potentially interfere with experimental tests.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 to 2 hours, <5 days a week N=12 Additional 30 minutes of virtual reality therapy every session of conventional physical therapy. The IREX VR system was used to empower the motivation and static and dynamic balance performance associated with gait in patients with stroke. This portable VR system comprises a television monitor, a video camera, cyber gloves and virtual objects, scenes and a large screen. The video camera system captures body images, and the subject is then immersed inside a VR scene, interacting with virtual environments and objects. Subjects can move freely in the real world while manipulating virtual objects in the 3D virtual world. This includes stepping up/down, sharkbait and snowboard games to increase the range of motion, balance, mobility, stepping and ambulation skills. The VR tasks were designed to stimulate the development of diverse balance, weight shifting and stepping skills to improve the reacquisition of locomotor skills, with each game programmed to exercise one or multiple aspects of trunk, pelvis, hip, knee and ankle movement. This program progressed

	along with the motor-relearning principles of specificity and hierarchy of balance and locomotion skills. As patients' ability to perform the exercise games increased, we gradually challenged them by either increasing resistive force or speed of the stimulus. Initially, a high frequency of augmented knowledge of performance or knowledge of result feedback was gradually lessened as performance improved. Each game was practiced five times, and depending on a game within each game, there were three levels of 88-131 opportunities to perform the exercise. The intervention was delivered for 4 weeks. Concomitant therapy: Conventional physical therapy, 40 minutes a day, 4 days a week for 4 weeks. Designed to facilitate symmetrical static and dynamic standing balance function during walking in individuals with chronic hemiparetic stroke, as a part of regular neurorehabilitation regime.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, <5 days a week N=12 Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 40 minutes a day, 4 days a week for 4 weeks. Designed to facilitate symmetrical static and dynamic standing balance function during walking in individuals with chronic hemiparetic stroke, as a part of regular neurorehabilitation regime.
Number of participants	24
Duration of follow-up	4 weeks

Indirectness	No additional information
Elements of the study relating to qualitative themes	Person factors Motivation - The intervention was designed to provide motivation for rehabilitation Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - several different programmes to exercise different parts of the body Environmental factors Hospital care Use of expensive equipment
Additional comments	No information on the method of analysis. People have not obviously appeared to dropped out of the trial, so possibly ITT?

Study arms

Physiotherapy - >1 to 2 hours, <5 days a week (N = 12)
Additional 30 minutes of virtual reality therapy every session of conventional physical therapy. The IREX VR system was used to empower the motivation and static and dynamic balance performance associated with gait in patients with stroke. This portable VR system comprises a television monitor, a video camera, cyber gloves and virtual objects, scenes and a large screen. The video camera system captures body images, and the subject is then immersed inside a VR scene, interacting with virtual environments and objects. Subjects can move freely in the real world while manipulating virtual objects in the 3D virtual world. This includes stepping up/down, sharkbait and snowboard games to increase the range of motion, balance, mobility, stepping and ambulation skills. The VR tasks were designed to stimulate the development of diverse balance, weight shifting and stepping skills to improve the reacquisition of locomotor skills, with each game programmed to exercise one or multiple aspects of trunk, pelvis, hip, knee and ankle movement. This program progressed along with the motor-relearning principles of specificity and hierarchy of balance and locomotion skills. As patients' ability to perform the exercise games increased, we gradually challenged them by either increasing resistive force or speed of the stimulus. Initially, a high frequency of augmented knowledge of performance or knowledge of result feedback was gradually lessened as performance improved. Each game was practiced five times, and depending on a game within each game, there were three levels of 88-131 opportunities to perform the exercise. The intervention was delivered for 4 weeks. Concomitant therapy: Conventional physical therapy, 40 minutes a day, 4 days a week for 4 weeks. Designed to facilitate symmetrical static and dynamic standing balance function during walking in individuals with chronic hemiparetic stroke, as a part of regular neurorehabilitation regime.

Physiotherapy - </=45 minutes, <5 days a week (N = 12)
Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 40 minutes a day, 4 days a week for 4 weeks. Designed to facilitate symmetrical static and dynamic standing balance function during walking in individuals with chronic hemiparetic stroke, as a part of regular neurorehabilitation regime.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, <5 days a week (N = 12)	Physiotherapy - </=45 minutes, <5 days a week (N = 12)
% Female Sample size	n = 6 ; % = 50	n = 5 ; % = 42
Mean age (SD) (years) Mean (SD)	52.42 (10.09)	51.75 (7.09)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	25.91 (9.96)	24.25 (8.87)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, <5 days a week compared to Physiotherapy - </=45 minutes, <5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 to 2 hours, <5 days a week, Baseline, N = 12	Physiotherapy - >1 to 2 hours, <5 days a week, 4 week, N = 12	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 12	Physiotherapy - </=45 minutes, <5 days a week, 4 week, N = 12
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	44.42 (5.99)	51.17 (4.02)	46.67 (3.75)	48.25 (4.22)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

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

Physiotherapy->1to2hours,<5daysaweekcomparedtoPhysiotherapy-</=45minutes,<5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 to 2 hours, <5 days a week-Physiotherapy - </=45 minutes, <5 days a week-t4

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

Kim, 2017

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

Study details

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

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	South Korea.
Study setting	Inpatients in the rehabilitation centers from South Korea.
Study dates	No additional information.
Sources of funding	No additional information.
Inclusion criteria	Confirmed clinically by computer tomography scans or magnetic resonance imaging; within 6 months after stroke; presented the ability to walk at least 10 meters alone or with an aid, but without standby assistance.
Exclusion criteria	Atrial fibrillation; uncontrolled hypertension; symptoms of unstable cardiac disease; recent pulmonary embolism; subacute systemic illness or infection.
Recruitment / selection of participants	Inpatients in the rehabilitation centres from South Korea.
Intervention(s)	Physiotherapy - >1-2 hours, 5 days a week N=15 Task-oriented circuit training at the rehabilitation center, for a total of 50 minutes, five times a week, for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 50 minutes, five times a week for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 20 sessions. All training sessions were organised into groups, with at least 2-3 people/group, and were conducted by two physical therapists (with 3 years of experience in stroke rehabilitation). Task-oriented circuit training was modified and incorporated 10 workstations. It consisted of task-oriented activities for improving balance, walking competence, and respiration ability. At all stations patients practiced for 3 minutes, and this sessions was followed by a 1 minute transfer to the next station. These core

	practice activities were: sit to stand; stepping; tandem standing; one leg standing; and reaching; walking practice included obstacles, reaching, slope and stairs. These core activities were individually adjusted for each person. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes-1 hour, 5 days a week 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	No additional information.

Elements of the study relating to qualitative themes	Group-based therapy Variety in activities and choice - circuit based therapy so variation between circuits Hospital care - Was delivered in a rehabilitation center Supervision - completed with 1 staff member to at least 2-3 people.
Additional comments	Intention to treat (no dropouts)

Study arms

Physiotherapy - >1-2 hours, 5 days a week (N = 15)
Task-oriented circuit training at the rehabilitation center, for a total of 50 minutes, five times a week, for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 50 minutes, five times a week for 4 weeks. The length of intervention was 4 weeks, 5 sessions of weekly training, for a total of 20 sessions. All training sessions were organised into groups, with at least 2-3 people/group, and were conducted by two physical therapists (with 3 years of experience in stroke rehabilitation). Task-oriented circuit training was modified and incorporated 10 workstations. It consisted of task-oriented activities for improving balance, walking competence, and respiration ability. At all stations patients practiced for 3 minutes, and this sessions was followed by a 1 minute transfer to the next station. These core practice activities were: sit to stand; stepping; tandem standing; one leg standing; and reaching; walking practice included obstacles, reaching, slope and stairs. These core activities were individually adjusted for each person. Concomitant therapy: Both groups received neuro-development treatment (postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 15)
Exercise focused on task-oriented exercise, such as strengthening exercise (resistance exercise), standing balance (using varying methods) and functional activities for gait improvement. Concomitant therapy: Both groups received neuro-development treatment

(postural control exercise, resistance exercise and functional activity exercise) for approximately 1 hour per day. In addition, they received some other therapies, including occupational and speech therapy, as needed.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1-2 hours, 5 days a week (N = 15)**	**Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 15)**
% Female Sample size	n = 5 ; % = 33	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	57.3 (12.3)	54 (11.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Mean (SD)	NR (NR)	NR (NR)
Time period since stroke (Months) Mean (SD)	3.3 (1.3)	4.4 (1.6)

Characteristic	Physiotherapy - >1-2 hours, 5 days a week (N = 15)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 15)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (Post-intervention)

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 15	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 15
Physical function - lower limb (Berg Balance Scale) (meters) Scale range: 0-56. Change scores. Mean (SD)	45 (9.5)	6.6 (6.58)	40.9 (9)	5.27 (5.25)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

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

Continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Kim, 2019

Bibliographic Reference	Kim, M. S.; Kim, S. H.; Noh, S. E.; Bang, H. J.; Lee, K. M.; Robotic-Assisted Shoulder Rehabilitation Therapy Effectively Improved Poststroke Hemiplegic Shoulder Pain: A Randomized Controlled Trial; Archives of Physical Medicine & Rehabilitation; 2019; vol. 100 (no. 6); 1015-1022

Study details

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

Trial name / registration number	Clinical trial registration number: KCT0002696.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	People at a single tertiary university hospital
Study dates	For 12 months starting in March 2016.
Sources of funding	Supported by Wonkwang Institute of Clinical Medicine (2016-0669), Republic of Korea.
Inclusion criteria	Subacute stroke patients who reported hemiplegic shoulder pain with a minimum visual analog scale of 3 points (0- to 10-point scale). Positive pain was defined when pain was provoked around the shoulder girdle muscle, bicipital groove, and acromioclavicular joint during passive range of motion.
Exclusion criteria	Significant cognitive impairment (Korean version of the Mini-Mental State Examination <15) or language deficits; preexisting shoulder pain prior to stroke; definite shoulder abnormalities in the affected limb, on radiographs; suspected complex regional pain syndrome, central pain or myofascial pain syndrome.
Recruitment / selection of participants	People consecutively recruited from a single tertiary university hospital
Intervention(s)	Occupational therapy - </=45 minutes, 5 days a week N=19 Robotic-assisted shoulder rehabilitation therapy for 30 minutes per day, 5 times per week for a total of 20 sessions for 4 weeks. A pain-tolerable range of motion was determined through a physical examination. The robotic arm was mounted on the arm of the patient, who was lying in a supine position. After the arm was fixed in place with straps, the robotic arm was positioned approximately 10 degrees lower than the target angle. Next, the robotic arm increased to the pain-tolerable target angle. Next, the robotic arm increased to the pain-tolerable angle at a constant angular velocity, maintained that position for approximately 10 seconds, and then released to return to its original position. One cycle of the exercise lasted

	around 30 seconds, and this mobilisation was repeated every 5 minutes with 1 minute of rest between each cycle. This was repeated approximately 50 times per session, with the number varying dependent on the person's condition. Concomitant therapy: Conventional physical therapy provided twice per day for both groups. Including exercises by a Bobath approach and additional physical agent modalities, such as hot pack application, ultrasound and transcutaneous electrical nerve stimulation and analgesics. Other occupational, language and cognitive therapies commonly performed in stroke rehabilitation settings were carried out in both groups (the amount of time for conventional therapy is unclear).
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Upper limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Usual care N=19 Conventional therapy only (time not provided, but available to both study arms). Concomitant therapy: Conventional physical therapy provided twice per day for both groups. Including exercises by a Bobath approach and additional physical agent modalities, such as hot pack application, ultrasound and transcutaneous electrical nerve stimulation and analgesics. Other occupational, language and cognitive therapies commonly performed in stroke rehabilitation settings were carried out in both groups (the amount of time for conventional therapy is unclear).
Number of participants	38
Duration of follow-up	Immediately after the intervention, and 4 weeks after the end of intervention (8 weeks - considered as <6 months)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Person factors Medical status - The number of repetitions were changed dependent on the person's condition Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care Use of expensive equipment
Additional comments	Method of analysis unclear, does not appear to be intention to treat (people in the study who discontinued were not included in the analysis)

Study arms

Occupational therapy - </=45 minutes, 5 days a week (N = 19)
Robotic-assisted shoulder rehabilitation therapy for 30 minutes per day, 5 times per week for a total of 20 sessions for 4 weeks. A pain-tolerable range of motion was determined through a physical examination. The robotic arm was mounted on the arm of the patient, who was lying in a supine position. After the arm was fixed in place with straps, the robotic arm was positioned approximately 10 degrees lower than the target angle. Next, the robotic arm increased to the pain-tolerable target angle. Next, the robotic arm increased to the pain-tolerable angle at a constant angular velocity, maintained that position for approximately 10 seconds, and then

released to return to its original position. One cycle of the exercise lasted around 30 seconds, and this mobilisation was repeated every 5 minutes with 1 minute of rest between each cycle. This was repeated approximately 50 times per session, with the number varying dependent on the person's condition. Concomitant therapy: Conventional physical therapy provided twice per day for both groups. Including exercises by a Bobath approach and additional physical agent modalities, such as hot pack application, ultrasound and transcutaneous electrical nerve stimulation and analgesics. Other occupational, language and cognitive therapies commonly performed in stroke rehabilitation settings were carried out in both groups (the amount of time for conventional therapy is unclear).

Usual care (N = 19)
Conventional therapy only (time not provided, but available to both study arms). Concomitant therapy: Conventional physical therapy provided twice per day for both groups. Including exercises by a Bobath approach and additional physical agent modalities, such as hot pack application, ultrasound and transcutaneous electrical nerve stimulation and analgesics. Other occupational, language and cognitive therapies commonly performed in stroke rehabilitation settings were carried out in both groups (the amount of time for conventional therapy is unclear).

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - </=45 minutes, 5 days a week (N = 19)**	**Usual care (N = 19)**
% Female Sample size	n = 7 ; % = 39	n = 7 ; % = 39
Mean age (SD) (years) Mean (SD)	65.9 (9.4)	64.7 (8.3)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Occupational therapy - </=45 minutes, 5 days a week (N = 19)	Usual care (N = 19)
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Mean (SD)	8.8 (2.4)	9.6 (2.6)
Time period since stroke (Months) Mean (SD)	3.2 (0.9)	3.3 (0.9)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Occupational therapy - </=45 minutes, 5 days a week compared to Usual care at <6 months - continuous outcome

Outcome	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 19	Occupational therapy - </=45 minutes, 5 days a week, 8 week, N = 18	Usual care, Baseline, N = 19	Usual care, 8 week, N = 18
Activities of daily living (Korean Shoulder Disability	96 (4)	65 (6)	96 (3)	82 (10)

Outcome	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 19	Occupational therapy - </=45 minutes, 5 days a week, 8 week, N = 18	Usual care, Baseline, N = 19	Usual care, 8 week, N = 18
Questionnaire) Scale range: 0-100. Final values. Mean (SD)				

Activities of daily living (Korean Shoulder Disability Questionnaire) - Polarity - Lower values are better

Occupational therapy - </=45 minutes, 5 days a week compared to Usual care at <6 months - dichotomous outcome

Outcome	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 19	Occupational therapy - </=45 minutes, 5 days a week, 8 week, N = 19	Usual care, Baseline, N = 19	Usual care, 8 week, N = 19
Discontinuation Intervention: 1 due to stroke recurrence. Control: 1 due to gastric cancer. No of events	n = NA ; % = NA	n = 1 ; % = 5	n = NA ; % = NA	n = 1 ; % = 5

Discontinuation - Polarity - Lower values are better

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

Occupational therapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-continuousoutcome-Activitiesofdailyliving(KoreanShoulderDisabilityQuestionnaire)-MeanSD-Occupational therapy - </=45 minutes, 5 days a week-Usual care-t8

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

Occupational therapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - </=45 minutes, 5 days a week-Usual care-t8

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

Kim, 2014

Bibliographic Reference	Kim, M.; Cho, K.; Lee, W.; Community walking training program improves walking function and social participation in chronic stroke patients; Tohoku Journal of Experimental Medicine; 2014; vol. 234 (no. 4); 281-6

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Inpatient rehabilitation hospital
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	Hemiparesis from a single stroke occurring at least six months before; sufficient cognition to follow simple instructions and understand the purpose of the study (Korean version of the Mini-Mental State Examination score of at least 24 points); gait speed <0.8m/s; ability to walk 10 m independently without an assistive device; absence of a musculoskeletal condition that could potentially affect the ability to walk 10m independently without an assistive device; absence of a musculoskeletal condition that could potentially affect the ability to walk safely; absence of hemispatial neglect.
Exclusion criteria	Participation in other studies or rehabilitation programs; severe heart disease or uncontrolled hypertension and pain.

Recruitment / selection of participants	People undergoing standard rehabilitation at the inpatient rehabilitation hospital
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=11 Additional community walking training program 30 minutes per day, five times a week for four weeks. This used various real community environments, including walking near the hospital setting, walking outside the hospital setting on uneven ground, walking outside the hospital setting on uneven ground with obstacles and visiting a shopping center. Walking near the hospital setting was performed on a 200m route including the lobby, hallway and near the hospital. In the second week, walking outside of the hospital setting on uneven ground was performed near the hospital on a 300m route including pavement, a ramp and stairs. In the third week, walking outside the hospital setting on uneven ground was performed on a 400m route, including a gradual slope, crosswalk, and an unpaved road with obstacles. In the fourth week, subjects visited a shopping center near the hospital. Concomitant therapy: Standard rehabilitation program consisting of physical and occupational therapy for 60 minutes per day, five times a week for four weeks. Conventional physical therapy included increased trunk stability, lower-extremity muscle strength, and gait and was performed for 30 minutes, while occupational therapy including an upper-extremity training program for activities of daily living was performed for the other 30 minutes.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Mixed

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=11 Standard rehabilitation program only.

	Concomitant therapy: Standard rehabilitation program consisting of physical and occupational therapy for 60 minutes per day, five times a week for four weeks. Conventional physical therapy included increased trunk stability, lower-extremity muscle strength, and gait and was performed for 30 minutes, while occupational therapy including an upper-extremity training program for activities of daily living was performed for the other 30 minutes.
Number of participants	22
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care (but includes community based activities)
Additional comments	Method of analysis unclear. Given that people were excluded from the analysis, probably not ITT.

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 13)
Additional community walking training program 30 minutes per day, five times a week for four weeks. This used various real community environments, including walking near the hospital setting, walking outside the hospital setting on uneven ground, walking outside the hospital setting on uneven ground with obstacles and visiting a shopping center. Walking near the hospital setting was performed on a 200m route including the lobby, hallway and near the hospital. In the second week, walking outside of the hospital setting on uneven ground was performed near the hospital on a 300m route including pavement, a ramp and stairs. In the third week, walking outside the hospital setting on uneven ground was performed on a 400m route, including a gradual slope, crosswalk, and an unpaved road with obstacles. In the fourth week, subjects visited a shopping center near the hospital. Concomitant therapy: Standard rehabilitation program consisting of physical and occupational therapy for 60 minutes per day, five times a week for four weeks. Conventional physical therapy included increased trunk stability, lower-extremity muscle strength, and gait and was performed for 30 minutes, while occupational therapy including an upper-extremity training program for activities of daily living was performed for the other 30 minutes.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Standard rehabilitation program only. Concomitant therapy: Standard rehabilitation program consisting of physical and occupational therapy for 60 minutes per day, five times a week for four weeks. Conventional physical therapy included increased trunk stability, lower-extremity muscle strength, and gait and was performed for 30 minutes, while occupational therapy including an upper-extremity training program for activities of daily living was performed for the other 30 minutes.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 13)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
% Female Sample size	n = 5 ; % = 45.5	n = 4 ; % = 36.4

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 13)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Mean age (SD) (years) Mean (SD)	50.18 (10.29)	50.73 (7.24)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	190.45 (108.46)	272.82 (107.71)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 13	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 11
Person/participant generic health-related quality of life (Stroke Impact Scale Social Participation) Scale range: 0-100. Change scores. Only reports the social participation score. Mean (SD)	42.34 (20.79)	12.49 (10.17)	38.36 (18)	4.25 (3.77)
Physical function - lower limb (10 meter walk test) (m/s) Change scores Mean (SD)	0.51 (0.16)	0.19 (0.17)	0.48 (0.18)	0.07 (0.07)

Person/participant generic health-related quality of life (Stroke Impact Scale Social Participation) - Polarity - Higher values are better
Physical function - lower limb (10 meter walk test) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 13	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 13
Discontinuation 2 people dropped out from each group due to health conditions, personal reasons or discharge (specific reasons not given) No of events	n = NA ; % = NA	n = 2 ; % = 15	n = NA ; % = NA	n = 2 ; % = 15

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScaleSocialParticipation)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(10meterwalktest)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Kim, 2015

Bibliographic Reference	Kim, S. J.; Cho, H. Y.; Kim, Y. L.; Lee, S. M.; Effects of stationary cycling exercise on the balance and gait abilities of chronic stroke patients; Journal of Physical Therapy Science; 2015; vol. 27 (no. 11); 3529-31

Study details

Secondary publication of	No additional information

another included study- see primary study for details	
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Hospital setting
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	Presence of hemiparesis secondary to stroke that had occurred in the past 6 months; ability to walk 10m independently with or without an assistive device; ability to communicate and understand; with a Mini-Mental Status Examination score of more than 21 points.
Exclusion criteria	Visual disorders or visual field deficit; known musculoskeletal conditions that would affect the ability to walk safely.
Recruitment / selection of participants	No additional information.

Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=16 Additional daily session of stationary cycling exercise, 30 minutes, 5 times a week for 4 weeks (or 6 weeks - it's unclear from the writing in the paper. As outcomes are reported to be examined at the end of the 4 week training program, it shall be assumed to be 4 weeks). Concomitant therapy: Standard rehabilitation program for 30 minutes, 5 times a week for 4 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=16 Standard rehabilitation program only. Concomitant therapy: Standard rehabilitation program for 30 minutes, 5 times a week for 4 weeks.
Number of participants	32
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No information about method of analysis. Appears that no one discontinued the trial.

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 16)
Additional daily session of stationary cycling exercise, 30 minutes, 5 times a week for 4 weeks (or 6 weeks - it's unclear from the writing in the paper. As outcomes are reported to be examined at the end of the 4 week training program, it shall be assumed to be 4 weeks). Concomitant therapy: Standard rehabilitation program for 30 minutes, 5 times a week for 4 weeks.

Physiotherapy - </=45 minutes, 5 days a week (N = 16)
Standard rehabilitation program only. Concomitant therapy: Standard rehabilitation program for 30 minutes, 5 times a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 16)	Physiotherapy - </=45 minutes, 5 days a week (N = 16)
% Female Sample size	n = 4 ; % = 25	n = 3 ; % = 19
Mean age (SD) (years) Mean (SD)	65.2 (6.4)	61.7 (6.1)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 16	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 16	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 16	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 16
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Change scores. Mean (SD)	36.15 (5.98)	1.75 (1.52)	37.06 (5.61)	0.4 (0.88)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Kim, 2016

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

Study details

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

Trial name / registration number	No additional information.
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatients.
Study dates	August 2012 to October 2013.
Sources of funding	Supported by the research grant of the Jeju National University in 2012.
Inclusion criteria	Clinical diagnosis of a first stroke confirmed by neuroimaging (computed tomography or magnetic resonance imaging); a hemiparesis; a time interval between stroke and recruitment of 3 months or less; the ability to comprehend the instructions for the testing procedures; mild to moderate walking deficit as indicated by Functional Ambulation Category between 3 and 4.
Exclusion criteria	A severe cognitive impairment (K-MMSE <10) of aphasia; previous stroke history; not independent 'sit to stand' activity (Berg Balance Scale score <18); acute systemic illness or infection; a significant orthopedic condition or pain that limited participation in exercise; visual impairment or vestibular system deficit that caused balance impairment.
Recruitment / selection of participants	Recruited from the Department of Physical Medicine and Rehabilitation of Jeju National University Hospital between August 2012 and October 2013.
Intervention(s)	Physiotherapy - >1-2 hours, 5 days a week N=10 90-minute circuit training classes, 5 times per week for 4 weeks. At least two people were under the supervision of one physiotherapist who attended all classes. Circuit training consisted of a 5 minute warm up period, five classes of 15 minute duration of complex exercises interspersed by 1 minute rests and a 5 minute cool down period. The five categories of complex exercises included trunk exercise and active sitting practice, sit-to-stand practice (easier stages), standing and walking practice (harder, but still core training), aerobic exercise training and strengthening training. These occurred in stages when where people completed easier stages, or showed an increased level of walking independence, they were

	permitted to move up to the next category of core activities in the next 15 minute exercise period. However, if the person could not perform the activities in a category by themself, that person did not attempt the exercise in the higher category. The core activities were performed in the first three 15 minute periods of the circuit training class after warm up. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes-1 hour, 5 days a week N=10 Conventional individual physiotherapy for 30 minutes twice a day, 5 days a week for 4 weeks. The content was based on neurodevelopment treatment for motor recovery. Concomitant therapy: No additional information.
Number of participants	20
Duration of follow-up	4 weeks
Indirectness	No additional information.

Elements of the study relating to qualitative themes	Person centered care: Intensity tailored to the individual - Therapy was split during the day Group-based therapy Variety in activities and choice - Circuit class training so varied activities throughout sessions Hospital care Supervision - 2.1 supervision
Additional comments	Intention to treat (no dropouts)

Study arms

Physiotherapy - >1-2 hours, 5 days a week (N = 10)
90-minute circuit training classes, 5 times per week for 4 weeks. At least two people were under the supervision of one physiotherapist who attended all classes. Circuit training consisted of a 5 minute warm up period, five classes of 15 minute duration of complex exercises interspersed by 1 minute rests and a 5 minute cool down period. The five categories of complex exercises included trunk exercise and active sitting practice, sit-to-stand practice (easier stages), standing and walking practice (harder, but still core training), aerobic exercise training and strengthening training. These occurred in stages when where people completed easier stages, or showed an increased level of walking independence, they were permitted to move up to the next category of core activities in the next 15 minute exercise period. However, if the person could not perform the activities in a category by themself, that person did not attempt the exercise in the higher category. The core activities were performed in the first three 15 minute periods of the circuit training class after warm up. Concomitant therapy: No additional information.

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 10)
Conventional individual physiotherapy for 30 minutes twice a day, 5 days a week for 4 weeks. The content was based on neurodevelopment treatment for motor recovery. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1-2 hours, 5 days a week (N = 10)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 10)
% Female Sample size	n = 4 ; % = 40	n = 3 ; % = 30
Mean age (SD) (years) Mean (SD)	65.2 (10.1)	66 (8.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	30.1 (21.8)	29.9 (20.3)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (Post-intervention)

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 10	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 10	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 10
Physical function - lower limb (Fugl Meyer Assessment - Lower Limb) Scale range: 0-34. Change scores. Mean (SD)	25.4 (7.5)	2 (2.79)	22.9 (7.9)	3 (4.6)
Activities of daily living (Korean-Modified Barthel Index) Scale range: 0-100. Change scores. Mean (SD)	65.7 (23.3)	21.3 (15.13)	57.4 (22.4)	27.9 (14.93)

Physical function - lower limb (Fugl Meyer Assessment - Lower Limb) - Polarity - Higher values are better
Activities of daily living (Korean-Modified Barthel Index) - Polarity - Higher values are better

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

Continuousoutcomes-Physicalfunction-lowerlimb(FuglMeyerAssessment-LowerLimb)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Activitiesofdailyliving(Korean-ModifiedBarthelIndex)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Klassen, 2020

Bibliographic Reference	Klassen, T. D.; Dukelow, S. P.; Bayley, M. T.; Benavente, O.; Hill, M. D.; Krassioukov, A.; Liu-Ambrose, T.; Pooyania, S.; Poulin, M. J.; Schneeberg, A.; Yao, J.; Eng, J. J.; Higher Doses Improve Walking Recovery During Stroke Inpatient Rehabilitation; Stroke; 2020; vol. 51 (no. 9); 2639-2648

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	Klassen, T. D.; Dukelow, S. P.; Bayley, M. T.; Benavente, O.; Hill, M. D.; Krassioukov, A.; Liu-Ambrose, T.; Pooyania, S.; Poulin, M. J.; Yao, J.; Eng, J. J.; Determining optimal poststroke exercise: Study protocol for a randomized controlled trial investigating therapeutic intensity and dose on functional recovery during stroke inpatient rehabilitation; International Journal of Stroke; 2019; vol. 14 (no. 1); 80-86
Trial name / registration number	NCT01915368
Study type	Randomised controlled trial (RCT)
Study location	United States of America
Study setting	6 study inpatient rehabilitation units over 3 provinces (G.F. Strong Rehabilitation Centre, Holy Family Hospital, Laurel Place, Carewest Dr Vernon Fanning Centre, Foothills Medical Centre, Riverview Health Centre).
Study dates	March 1, 2014 to July 1, 2018
Sources of funding	This work was supported by the: Canadian Institutes of Health Research (Doctoral award to Dr Klassen; Operating Grant FDN 143340 to Dr Eng); Heart and Stroke Foundation Canadian Partnership for Stroke Recovery Operating Grant (Dr Eng); Canadian Stroke Network infrastructure (Dr Hill); Brenda Strafford Foundation Chair in Alzheimer Research (Dr Poulin).
Inclusion criteria	A confirmed primary diagnosis of stroke (infarct or intra-cerebral haemorrhage) by a neurologist using either magnetic resonance imaging or computer axial tomography; within 10 weeks poststroke with lower extremity hemiparesis (<4/5 manual muscle grade in at least one of the major lower extremity muscles); prestroke disability <2 on the modified Rankin Scale; ability to ambulate at least 5 meters with up to one person maximum assist and assistive/orthotic device as required;

	over-ground walking speed <1.0 m/s; able to understand and follow directions; >18 years of age; successful completion of a graded exercise stress test using criteria established by the American College of Sports Medicine.
Exclusion criteria	A prestroke health condition that included a gait disorder; another neurological condition (eg, Parkinson's); serious medical or painful condition (eg, active cancer); enrolled in a drug or exercise rehabilitation study.
Recruitment / selection of participants	Consecutive patient admissions from the 6 study inpatient rehabilitation units over 3 provinces
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=25 DOSE2: 2 hours, 5 days/week, more than quadruple the intensity of control, for 4 weeks. For DOSE2, interventions included the DOSE 1 intervention 20 exercise sessions to: 1) complete a minimum of 30 minutes at an intensity at least 40% HRR, gradually progressing to >60% HRR by the end of the 4 weeks; 2) achieve >2000 walking steps using the same monitoring equipment as the control group, but all 20 intervention sessions were monitored and the DOSE2 intervention, an extra 1-hour exercise session, 5 days/week, for 4 weeks which occurred later in the day (i.e. typically 4 to 5pm daily). The content was similar to the DOSE1 protocol, containing a minimum of 30 minutes of weight-bearing walking related activities; however, the remaining time within the hour session was dedicated to weight-bearing lower extremity exercises. The monitoring equipment was worn for all 40 intervention sessions. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=25 Two groups, DOSE1 (N=25) and usual care (N=25). Usual care included physical therapy was inpatient physical therapy that progressed upper and lower limb functional exercises as tolerated. To capture the actual exercise intensity, wearable sensors (Alpha Mio heart rate monitor wrist watch, Mio Global, Vancouver and Fitbit One step counter, Fitbit, Inc, San

	Francisco) were worn during 10 of the sessions. DOSE1 included 20 exercise sessions to: 1) complete a minimum of 30 minutes at an intensity at least 40% HRR, gradually progressing to >60% HRR by the end of the 4 weeks; 2) achieve >2000 walking steps using the same monitoring equipment as the control group, but all 20 intervention sessions were monitored. Concomitant therapy: No additional information
Number of participants	75
Duration of follow-up	4 weeks (<6 months), 6 months and 12 months (≥6 months)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person Cantered Care - Therapy sessions were split to be twice a day for the most intense group (with the additional therapy occurring in the afternoon) Intervention factors: Individual therapy Environmental factors: Hospital care
Additional comments	Method of analysis unclear

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 25)
DOSE2: 2 hours, 5 days/week, more than quadruple the intensity of control, for 4 weeks. For DOSE2, interventions included the DOSE 1 intervention 20 exercise sessions to: 1) complete a minimum of 30 minutes at an intensity at least 40% HRR, gradually progressing to >60% HRR by the end of the 4 weeks; 2) achieve >2000 walking steps using the same monitoring equipment as the control group, but all 20 intervention sessions were monitored and the DOSE2 intervention, an extra 1-hour exercise session, 5 days/week, for 4 weeks which occurred later in the day (i.e. typically 4 to 5pm daily). The content was similar to the DOSE1 protocol, containing a minimum of 30 minutes of weight-bearing walking related activities; however, the remaining time within the hour session was dedicated to weight-bearing lower extremity exercises. The monitoring equipment was worn for all 40 intervention sessions. Concomitant therapy: No additional information.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 50)
Two groups, DOSE1 (N=25) and usual care (N=25). Usual care included physical therapy was inpatient physical therapy that progressed upper and lower limb functional exercises as tolerated. To capture the actual exercise intensity, wearable sensors (Alpha Mio heart rate monitor wrist watch, Mio Global, Vancouver and Fitbit One step counter, Fitbit, Inc, San Francisco) were worn during 10 of the sessions. DOSE1 included 20 exercise sessions to: 1) complete a minimum of 30 minutes at an intensity at least 40% HRR, gradually progressing to >60% HRR by the end of the 4 weeks; 2) achieve >2000 walking steps using the same monitoring equipment as the control group, but all 20 intervention sessions were monitored. Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 25)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 50)
% Female	n = 11 ; % = 44	n = 19 ; % = 38

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 25)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 50)
Sample size		
Mean age (SD) (years) Mean (SD)	58 (10)	57 (12)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Mean (SD)	5 (3)	5 (3)
Time period since stroke (days) Mean (SD)	29 (10)	27 (11)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)
- 12 month (≥6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes (1)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >1 to 2 hours, 5 days a week, 12 month, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 month, N = 37
Person/participant generic health-related quality of life (EQ-5D-5L) Scale range: -0.11-1. Final values. Mean (SD)	0.65 (0.19)	0.82 (0.09)	0.83 (0.08)	0.6 (0.19)	0.75 (0.13)	0.79 (0.15)
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	32.6 (14.8)	48.6 (8.7)	NR (NR)	33.6 (12.9)	47.1 (8.6)	NR (NR)

Person/participant generic health-related quality of life (EQ-5D-5L) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes (2)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >1 to 2 hours, 5 days a week, 12 month, N = 21	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 month, N = 36
Physical function - lower limb (6 minute-walk test) (meters) The <6 months value is not to be included in the analysis (is of a lower priority for inclusion than the Berg Balance Scale), but is included here for completeness. Final values. Mean (SD)	138 (95.5)	315 (142)	375 (147)	129 (88.2)	277.1 (131.8)	376 (165.8)

Physical function - lower limb (6 minute-walk test) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes (3)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >1 to 2 hours, 5 days a week, 12 month, N = 24	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 48	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 month, N = 48
Psychological distress - Depression	7.5 (4.8)	3.8 (3.7)	NR (NR)	5.7 (4.9)	4.3 (5.5)	NR (NR)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 24	Physiotherapy - >1 to 2 hours, 5 days a week, 12 month, N = 24	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 49	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 48	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 month, N = 48
(PHQ-9) Scale range: 0-27. Final values. Mean (SD)						

Psychological distress - Depression (PHQ-9) - Polarity - Lower values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 25	Physiotherapy - >1 to 2 hours, 5 days a week, 12 month, N = 25	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 50	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 50	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 month, N = 50
Discontinuation Intervention: <6 months: Did not complete intervention = 1. >/=6 months: medical = 1, withdrew = 2. Control: <6 months = 1 found to not fulfil inclusion criteria. >/=6 months = 6 withdrew, 6 lost to follow up, 1 medical. No of events	n = NA ; % = NA	n = 1 ; % = 4	n = 4 ; % = 16	n = NA ; % = NA	n = 1 ; % = 2	n = 14 ; % = 28

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(1)-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(1)-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t12

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(1)-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(2)-Physicalfunction-lowerlimb(6minute-walktest)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(2)-Physicalfunction-lowerlimb(6minute-walktest)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t12

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes(3)-Psychologicaldistress-Depression(PHQ-9)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t12

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

Klassen, 2019

Bibliographic Reference	Klassen, T. D.; Dukelow, S. P.; Bayley, M. T.; Benavente, O.; Hill, M. D.; Krassioukov, A.; Liu-Ambrose, T.; Pooyania, S.; Poulin, M. J.; Yao, J.; Eng, J. J.; Determining optimal poststroke exercise: Study protocol for a randomized controlled trial investigating therapeutic intensity and dose on functional recovery during stroke inpatient rehabilitation; International Journal of Stroke; 2019; vol. 14 (no. 1); 80-86

Study details

Secondary publication of another included study- see primary study for details	Klassen, T. D.; Dukelow, S. P.; Bayley, M. T.; Benavente, O.; Hill, M. D.; Krassioukov, A.; Liu-Ambrose, T.; Pooyania, S.; Poulin, M. J.; Schneeberg, A.; Yao, J.; Eng, J. J.; Higher Doses Improve Walking Recovery During Stroke Inpatient Rehabilitation; Stroke; 2020; vol. 51 (no. 9); 2639-2648

Ko, 2015

Bibliographic Reference	Ko, Y.; Ha, H.; Bae, Y. H.; Lee, W.; Effect of space balance 3D training using visual feedback on balance and mobility in acute stroke patients; Journal of Physical Therapy Science; 2015; vol. 27 (no. 5); 1593-6

Study details

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

Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Inpatient
Study dates	No additional information
Sources of funding	This study was supported by Sahmyook University
Inclusion criteria	Acute stroke patients; 18-65 years old; diagnosed with stroke within the last 6 months; able to walk more than 10 meters without or with assisting devices such as orthotics, a walker or a cane; a score higher than 24 points on the MMSE; able to read the words on a monitor 60cm away at eye level.
Exclusion criteria	Symptoms with any lower motor neuron lesion and orthopedic diseases
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy </=45 minutes, 5 days a week N=26 Additional balance training with a Space Balance 3D exercise program for 30 minutes, 15 sessions over 3 weeks.. The training system is equipped with two wireless force plates and can check the distribution of weight on four plates placed under the left and right forefeet and heels. The degree of tilting is assessed by a tilt sensor in the front of the apparatus.

	Three kinds of balance training were implemented using Space Balance 3D, which can be used for both training and testing. According to the subjects' movement, the real-time tilting angle and foot plates are indicated on a computer screen. Horizontal exercise is used as a training program for left and right balance. In this exercise, the patient moves in the left or right direction to "hit" a predetermined target. This exercise is for improving control of left and right balance. Vertical exercise is used as a training program for forward and backward direction to hit a predetermined target. The exercise is for improving control of forward and backward balance. A horizontal exercise program is more difficult than a circle exercise program. In this exercise, the patient moves horizontally in a pattern to hit a predetermined target. In this program, deviation of the movement of the patient from the line indicates decreased balance function. Concomitant therapy: Usual care (5 days a week, time not specified).
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Usual care N=26 Usual care only. Concomitant therapy: Usual care (5 days a week, time not specified).
Number of participants	52
Duration of follow-up	3 weeks (end of intervention)
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention themes Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information

Study arms

Physiotherapy </=45 minutes, 5 days a week (N = 26)
Additional balance training with a Space Balance 3D exercise program for 30 minutes, 15 sessions over 3 weeks.. The training system is equipped with two wireless force plates and can check the distribution of weight on four plates placed under the left and right forefeet and heels. The degree of tilting is assessed by a tilt sensor in the front of the apparatus. Three kinds of balance training were implemented using Space Balance 3D, which can be used for both training and testing. According to the subjects' movement, the real-time tilting angle and foot plates are indicated on a computer screen. Horizontal exercise is used as a training program for left and right balance. In this exercise, the patient moves in the left or right direction to "hit" a predetermined target. This exercise is for improving control of left and right balance. Vertical exercise is used as a training program for forward and backward direction to hit a predetermined target. The exercise is for improving control of forward and backward balance. A horizontal exercise program is more difficult than a circle exercise program. In this exercise, the patient moves horizontally in a pattern to hit a predetermined target. In this program, deviation of the movement of the patient from the line indicates decreased balance function. Concomitant therapy: Usual care (5 days a week, time not specified).

Usual care (N = 26)
Usual care only. Concomitant therapy: Usual care (5 days a week, time not specified).

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy </=45 minutes, 5 days a week (N = 26)	Usual care (N = 26)
% Female Sample size	n = 6 ; % = 23	n = 10 ; % = 39
Mean age (SD) (years) Mean (SD)	48.1 (4.4)	45.3 (4.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	NR (NR)	NR (NR)
Type of communication difficulty	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy </=45 minutes, 5 days a week (N = 26)	Usual care (N = 26)
Sample size		

Outcomes

Study timepoints

- Baseline
- 3 week (<6 months)

Physiotherapy </=45 minutes, 5 days a week compared to usual care at <6 months - continuous outcome

Outcome	Physiotherapy </=45 minutes, 5 days a week, Baseline, N = 26	Physiotherapy </=45 minutes, 5 days a week, 3 week, N = 26	Usual care, Baseline, N = 26	Usual care, 3 week, N = 26
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	36.6 (15)	49.8 (8.7)	21.1 (18.1)	37 (14.8)

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

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

Physiotherapy</=45minutes,5daysaweekcomparedtousualcareat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy </=45 minutes, 5 days a week-Usual care-t3

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

Kong, 2016

Bibliographic Reference	Kong, K. H.; Loh, Y. J.; Thia, E.; Chai, A.; Ng, C. Y.; Soh, Y. M.; Toh, S.; Tjan, S. Y.; Efficacy of a Virtual Reality Commercial Gaming Device in Upper Limb Recovery after Stroke: A Randomized, Controlled Study; Topics in Stroke Rehabilitation; 2016; vol. 23 (no. 5); 333-40

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Singapore
Study setting	An inpatient stroke rehabilitation program held in a rehabilitation centre in Singapore
Study dates	No additional information
Sources of funding	This study was funded by a Health Services Research Outcome grant, Ministry of Health, Singapore.
Inclusion criteria	Age 21-80 years; first clinical stroke, ischaemic or haemorrhagic, with diagnosis of stroke confirmed on CT/MRI brain scan; less than 6 weeks after stroke onset; upper limb weakness of Medical Research Council motor power of grade 2-4 motor power in either the shoulder, elbow or the fingers of the hemiplegic upper extremity; subject is able to understand simple instructions and learn.
Exclusion criteria	Recurrent stroke; history of epilepsy; presence of arthritis or pain in the affected upper limb restricting repetitive exercises; severe aphasia or cognitive impairment, or other psychiatric illnesses that limits ability to participate or give consent.
Recruitment / selection of participants	People in an inpatient stroke rehabilitation program at a rehabilitation centre in Singapore
Intervention(s)	Occupational therapy - >1 to 2 hours, 5 days a week N=70 Two groups: Nintendo Wii gaming (N=35) and conventional therapy (N=35). The Nintendo Wii group watched a 10 minute prerecorded video explaining the setup of the console and how the subject could correctly use the Wiimote (a wireless handheld pointing device that could interact with the sensor bar placed on the TV set to play games on the console) to interact with the games. Different games were designed to test the skills of the user in executing different movements and acceleration of the upper limbs. Before each treatment session, the Nintendo Wii was set up and calibrated to ensure the subject was able to point correctly at the sensor. The subject was asked to hold the Wiimote in the stroke-affected hand. For people with weak or no grasp, the Wiimote was stripped to their hands by either a customized fabric grasp assist or a

	crepe bandage. Games from the Wii Sports and Wii Sports Resort software were chosen which included: boxing, bowling, tennis, golf, baseball, table tennis, basketball, cycling, Frisbee disk, sword play and airplane flight control. Each game or part of a game was preselected taking into consideration the subject's preferences and residual upper limb functional capacity. Hence, different games or parts of games were used for different people. All games could be played both sitting and standing, depending on the person's balance capability. Assistance by a therapist to facilitate movement was provided when necessary. Conventional therapy consisted of stretching, strengthening and upper limb range of motion exercises. Exercises were task-oriented therapy with the aim of improving activities of daily living, fine motor skills and sensorimotor recovery. The occupational therapist chose the appropriate tasks for the individual patient and developed them in stages. For both, 12 sessions, 4 times a week over 3 weeks in addition to daily occupational therapy. Concomitant therapy: Usual upper limb exercises for 1 hour daily in occupational therapy.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Severe (or NIHSS 15-24)
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - >45 minutes to 1 hour, 5 days a week N=35 No additional treatment. Concomitant therapy: Usual upper limb exercises for 1 hour daily in occupational therapy.

Number of participants	105
Duration of follow-up	3 weeks (end of intervention, 7 weeks and 15 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - The exercises provided were adapted to the person's ability and preferences. Intervention factors: Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice Level of person centred care Need for technical support and training - instructional video for the Wii, but also required calibration and setting up for each sessions Physical environment - Need space for the sensor to pick up the controls effectively

	Environmental factors Hospital care Supervision - Provided additional support with exercises if required Use of expensive equipment
Additional comments	Intention-to-treat analysis

Study arms

Occupational therapy - >1 to 2 hours, 5 days a week (N = 70)
Two groups: Nintendo Wii gaming (N=35) and conventional therapy (N=35). The Nintendo Wii group watched a 10 minute prerecorded video explaining the setup of the console and how the subject could correctly use the Wiimote (a wireless handheld pointing device that could interact with the sensor bar placed on the TV set to play games on the console) to interact with the games. Different games were designed to test the skills of the user in executing different movements and acceleration of the upper limbs. Before each treatment session, the Nintendo Wii was set up and calibrated to ensure the subject was able to point correctly at the sensor. The subject was asked to hold the Wiimote in the stroke-affected hand. For people with weak or no grasp, the Wiimote was stripped to their hands by either a customized fabric grasp assist or a crepe bandage. Games from the Wii Sports and Wii Sports Resort software were chosen which included: boxing, bowling, tennis, golf, baseball, table tennis, basketball, cycling, Frisbee disk, sword play and airplane flight control. Each game or part of a game was preselected taking into consideration the subject's preferences and residual upper limb functional capacity. Hence, different games or parts of games were used for different people. All games could be played both sitting and standing, depending on the person's balance capability. Assistance by a therapist to facilitate movement was provided when necessary. Conventional therapy consisted of stretching, strengthening and upper limb range of motion exercises. Exercises were task-oriented therapy with the aim of improving activities of daily living, fine motor skills and sensorimotor recovery. The occupational therapist chose the appropriate tasks for the individual patient and developed them in stages. For both, 12 sessions, 4 times a week over 3 weeks in addition to daily occupational therapy. Concomitant therapy: Usual upper limb exercises for 1 hour daily in occupational therapy.

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 35)
No additional treatment. Concomitant therapy: Usual upper limb exercises for 1 hour daily in occupational therapy.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 70)	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 35)
% Female Sample size	n = 18 ; % = 26	n = 10 ; % = 29
Mean age (SD) (years) Mean (SD)	58.6 (11.6)	55.8 (11.5)
Ethnicity Sample size	n = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Ischaemic heart disease Sample size	n = 5 ; % = 7.1	n = 2 ; % = 5.7
Hypertension Sample size	n = 59 ; % = 78.7	n = 32 ; % = 91.4

Characteristic	Occupational therapy - >1 to 2 hours, 5 days a week (N = 70)	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 35)
Diabetes mellitus Sample size	n = 23 ; % = 30.7	n = 11 ; % = 31.4
Depression (according to CES-D) Sample size	n = 16 ; % = 21.3	n = 5 ; % = 14.2
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Mild impairment (FMA score >50) Sample size	n = 1 ; % = 1.3	n = 4 ; % = 11.4
Moderate impairment (FMA score 26-50) Sample size	n = 13 ; % = 17.3	n = 0 ; % = 0
Severe impairment (FMA score <26) Sample size	n = 58 ; % = 77.3	n = 25 ; % = 71.4
Time period since stroke (days) Mean (SD)	14.2 (9.2)	13.1 (8.6)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 15 week (<6 months)

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 70	Occupational therapy - >1 to 2 hours, 5 days a week, 15 week, N = 70	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 35	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 15 week, N = 35
Person/participant generic health-related quality of life (Stroke impact scale upper limb items) Scale range: 5-25. Final values. Mean (SD)	6.5 (2.3)	12.3 (8.2)	7.5 (3.1)	13.5 (6.9)
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	71.2 (14.8)	106.1 (22)	76.4 (16.1)	113.4 (16.6)
Physical function - upper limb (Fugl-Meyer assessment of upper limb) Scale range: 0-66. Final values. Mean (SD)	15.2 (12.1)	38.7 (20.2)	18 (14.4)	41.6 (18.1)

Person/participant generic health-related quality of life (Stroke impact scale upper limb items) - Polarity - Higher values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better
Physical function - upper limb (Fugl-Meyer assessment of upper limb) - Polarity - Higher values are better

Occupational therapy - >1 to 2 hours, 5 days a week compared to Occupational therapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Occupational therapy - >1 to 2 hours, 5 days a week, Baseline, N = 70	Occupational therapy - >1 to 2 hours, 5 days a week, 15 week, N = 70	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 35	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 15 week, N = 35
Discontinuation Intervention: 3 lost to follow up, 2 withdrew, 1 died before completion fo the intervention. Control: 2 lost to follow up (no additional information). No of events	n = NA ; % = NA	n = 6 ; % = 8.6	n = NA ; % = NA	n = 2 ; % = 5.7

Discontinuation - Polarity - Lower values are better

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(Strokeimpactscaleupperlimbitems)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t15

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t15

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(Fugl-Meyerassessmentofupperlimb)-MeanSD-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t15

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

Occupationaltherapy->1to2hours,5daysaweekcomparedtoOccupationaltherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - >1 to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-t15

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

Kongkasuwan, 2016

Bibliographic Reference	Kongkasuwan, R.; Voraakhom, K.; Pisolayabutra, P.; Maneechai, P.; Boonin, J.; Kuptniratsaikul, V.; Creative art therapy to enhance rehabilitation for stroke patients: a randomized controlled trial; Clinical Rehabilitation; 2016; vol. 30 (no. 10); 1016-1023

Study details

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

Sources of funding	This study was supported by the National Research Council of Thailand.
Inclusion criteria	Stroke patients aged more than 50 years who could communicate verbally (answer questions reasonably) and willing to cooperate with the study.
Exclusion criteria	Unstable medical conditions; history of severe dementia and uncontrolled behaviour such as agitation or confusion. People who had severe adverse events or patient withdrawal were excluded.
Recruitment / selection of participants	No additional information
Intervention(s)	Cognitive therapy - >2 to 4 hours, 5 days a week N=59 Additional creative art therapy, twice a week for four weeks (8 sessions) in the rehabilitation ward. Each session of creative art therapy, twice a week for four weeks (8 sessions) in the rehabilitation ward. Each session lasted 1.5-2 hours and involved groups of 5-10 patients. The creative activities were designed to stimulate and benefit cognition, physical state, emotion, communication, social relations and spiritual dimensions. There were give stages to the therapy: meditation with music, warm-up activity, main activity and group singing activity, ending with a group-healing circle. The main activity in each session was composed of eight art process-based activities. Therapists provided one main activity for each session for a total of eight sessions per course. During each sessions, the creative art therapist encouraged patients to participate in the creative art processes and express their creativity in a safe and relaxed setting. Positive thinking about their capability to create art, their ability to reflect and share stories, and to share the inspiration behind their art with others are keys to empower patients during these activities. In the group singing activity, which was a form of indirect self-expression, people were encouraged to sing along to a range of cheerful songs. Every person was asked to choose their favourite meaningful sentence from the song lyrics and explain the reason to the group. People had an opportunity to express their feelings as well as to improve their mood through their song selection. Before ending each session, a "healing circle" was performed, which was a ceremony designed to increase patients' spiritual strength through a breathing meditation accompanied by calm music. People were asked to make a wish and to dedicate the merit to themselves and to others for whom they cared. This ceremony was a form of the Buddhist practice of dedicating to others merit accumulated through virtuous deeds. The aim was to enhance self-compassion, which was a crucial component of self-healing.

	Concomitant therapy: All people received a conventional physical therapy program five days per week (20 sessions) conducted by a physical therapist. This consisted of range of motion exercises for the paralyzed limb, strengthening exercises for the sound limb, balancing exercises and ambulation training for 1-2 hours per day.
Intervention stratification - Type of therapist	Cognitive therapy/psychological therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Not stated/unclear
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Cognitive therapy - >1 to 2 hours, 5 days a week N=59 Conventional therapy only Concomitant therapy: All people received a conventional physical therapy program five days per week (20 sessions) conducted by a physical therapist. This consisted of range of motion exercises for the paralyzed limb, strengthening exercises for the sound limb, balancing exercises and ambulation training for 1-2 hours per day.
Number of participants	118
Duration of follow-up	4 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Group-based therapy

	Variety in activities and choice Environmental factors Hospital care
Additional comments	Per-protocol analysis

Study arms

Cognitive therapy - >2 to 4 hours, 5 days a week (N = 59)
Additional creative art therapy, twice a week for four weeks (8 sessions) in the rehabilitation ward. Each session of creative art therapy, twice a week for four weeks (8 sessions) in the rehabilitation ward. Each session lasted 1.5-2 hours and involved groups of 5-10 patients. The creative activities were designed to stimulate and benefit cognition, physical state, emotion, communication, social relations and spiritual dimensions. There were give stages to the therapy: meditation with music, warm-up activity, main activity and group singing activity, ending with a group-healing circle. The main activity in each session was composed of eight art process-based activities. Therapists provided one main activity for each session for a total of eight sessions per course. During each sessions, the creative art therapist encouraged patients to participate in the creative art processes and express their creativity in a safe and relaxed setting. Positive thinking about their capability to create art, their ability to reflect and share stories, and to share the inspiration behind their art with others are keys to empower patients during these activities. In the group singing activity, which was a form of indirect self-expression, people were encouraged to sing along to a range of cheerful songs. Every person was asked to choose their favourite meaningful sentence from the song lyrics and explain the reason to the group. People had an opportunity to express their feelings as well as to improve their mood through their song selection. Before ending each session, a "healing circle" was performed, which was a ceremony designed to increase patients' spiritual strength through a breathing meditation accompanied by calm music. People were asked to make a wish and to dedicate the merit to themselves and to others for whom they cared. This ceremony was a form of the Buddhist practice of dedicating to others merit accumulated through virtuous deeds. The aim was to enhance self-compassion, which

was a crucial component of self-healing. Concomitant therapy: All people received a conventional physical therapy program five days per week (20 sessions) conducted by a physical therapist. This consisted of range of motion exercises for the paralyzed limb, strengthening exercises for the sound limb, balancing exercises and ambulation training for 1-2 hours per day.

Cognitive therapy - >1 to 2 hours, 5 days a week (N = 59)
Conventional therapy only Concomitant therapy: All people received a conventional physical therapy program five days per week (20 sessions) conducted by a physical therapist. This consisted of range of motion exercises for the paralyzed limb, strengthening exercises for the sound limb, balancing exercises and ambulation training for 1-2 hours per day.

Characteristics

Arm-level characteristics

Characteristic	**Cognitive therapy - >2 to 4 hours, 5 days a week (N = 59)**	**Cognitive therapy - >1 to 2 hours, 5 days a week (N = 59)**
% Female Sample size	n = 32 ; % = 54.2	n = 31 ; % = 52.5
Mean age (SD) (years) Mean (SD)	67.1 (9.2)	65.5 (9.9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Cognitive therapy - >2 to 4 hours, 5 days a week (N = 59)	Cognitive therapy - >1 to 2 hours, 5 days a week (N = 59)
Diabetes mellitus Sample size	n = 19 ; % = 32.2	n = 26 ; % = 44.1
Hypertension Sample size	n = 53 ; % = 89.8	n = 49 ; % = 83.1
Dyslipidaemia Sample size	n = 48 ; % = 81.4	n = 37 ; % = 62.7
Cardiac disease Sample size	n = 7 ; % = 11.9	n = 8 ; % = 13.6
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	NR (NR)	NR (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Cognitive therapy - >2 to 4 hours, 5 days a week compared to Cognitive therapy - >1 to 2 hours, 5 days a week at <6 months - continuous outcomes

Outcome	Cognitive therapy - >2 to 4 hours, 5 days a week, Baseline, N = 59	Cognitive therapy - >2 to 4 hours, 5 days a week, 4 week, N = 54	Cognitive therapy - >1 to 2 hours, 5 days a week, Baseline, N = 59	Cognitive therapy - >1 to 2 hours, 5 days a week, 4 week, N = 59
Person/participant specific generic health-related quality of life (Pictorial Thai Quality of Life Scale) Scale range: 0-72. Change scores. Mean (SD)	31.7 (14.4)	17.5 (14.9)	33.3 (12.6)	8.6 (11.5)
Activities of daily living (barthel index) Scale range: 0-20. Change scores. Mean (SD)	9.1 (4)	4.7 (3.2)	8.4 (4.2)	3.5 (2.9)
Psychological distress - Depression (HADS depression) Scale range: 0-21. Change scores. Mean (SD)	10.7 (5.8)	-6.3 (6.5)	9.8 (5)	-1.8 (3.9)

Person/participant specific generic health-related quality of life (Pictorial Thai Quality of Life Scale) - Polarity - Higher values are better
Activities of daily living (barthel index) - Polarity - Higher values are better
Psychological distress - Depression (HADS depression) - Polarity - Lower values are better

Cognitive therapy - >2 to 4 hours, 5 days a week compared to Cognitive therapy - >1 to 2 hours, 5 days a week at <6 months - dichotomous outcome

Outcome	Cognitive therapy - >2 to 4 hours, 5 days a week, Baseline, N = 59	Cognitive therapy - >2 to 4 hours, 5 days a week, 4 week, N = 59	Cognitive therapy - >1 to 2 hours, 5 days a week, Baseline, N = 59	Cognitive therapy - >1 to 2 hours, 5 days a week, 4 week, N = 59
Discontinuation Withdrawal = 4, early discharge = 1. No of events	n = NA ; % = NA	n = 5 ; % = 8.5	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Cognitive therapy->2to4hours,5daysaweekcomparedtoCognitive therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Person/participantspecificgenerichealth-relatedqualityoflife(PictorialThaiQualityofLifeScale)-MeanSD-Cognitive therapy - >2 to 4 hours, 5 days a week-Cognitive therapy - >1 to 2 hours, 5 days a week-t4

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

Cognitive therapy->2to4hours,5daysaweekcomparedtoCognitive therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Cognitive therapy - >2 to 4 hours, 5 days a week-Cognitive therapy - >1 to 2 hours, 5 days a week-t4

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

Cognitive therapy->2to4hours,5daysaweekcomparedtoCognitive therapy->1to2hours,5daysaweekat<6months-continuousoutcomes-Psychologicaldistress-Depression(HADSdepression)-MeanSD-Cognitive therapy - >2 to 4 hours, 5 days a week-Cognitive therapy - >1 to 2 hours, 5 days a week-t4

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

Cognitive therapy->2to4hours,5daysaweekcomparedtoCognitive therapy->1to2hours,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Cognitive therapy - >2 to 4 hours, 5 days a week-Cognitive therapy - >1 to 2 hours, 5 days a week-t4

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

Kumar, V; Babu, K; Nayak, A., 2011

Bibliographic Reference	Kumar, V; Babu, K; Nayak, A.; Additional trunk training improves sitting balance following acute stroke: a pilot randomized controlled trial; Int J Curr Res Rev; 2011; vol. 2; 26-43

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	Karnataka, India
Study setting	Inpatient
Study dates	January 2009 to December 2009

Sources of funding	No additional information
Inclusion criteria	First onset of unilateral supra-tentorial stroke (ischaemic or haemorrhagic) who are stable and referred by physician for rehabilitation; post stroke duration less than 1 month duration; Mini Mental Status Scale score of at least 24; subject able to sit unsupported on a bed with their feet touching the ground for 30 seconds
Exclusion criteria	70 years of age of older; subjects who were not able to understand the instructions; subjects with non-stroke related sensory or motor impairments which were affecting their motor performance
Recruitment / selection of participants	People attending the stroke rehabilitation program
Intervention(s)	Physiotherapy - </=45 minutes, 6 days a week N=10 10 hours of additional trunk exercises over a period of 3 weeks. 10 hours in total, 45 minute sessions, 6 times a week for 3 weeks. This additional exercise consisted of selective movements of the upper and lower part of the trunk in supine and sitting including: Supine exercises, 1) bridging, 2) unilateral pelvic bridging, 3) trunk rotations. Sitting, 1) static sitting balance, 2) trunk flexion, 3) trunk lateral flexion, 4) trunk rotations (upper and lower), 5) weight shifts, 6) forward reach, 7) lateral reach, 8) perturbations. Concomitant therapy: Conventional multidisciplinary rehabilitation program (no information about amount of time). The program is patient-specific with main emphasis on the neurodevelopmental concept and on motor relearning strategies.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team

Comparator	Usual care N=10 Conventional program only. Concomitant therapy: Conventional multidisciplinary rehabilitation program (no information about amount of time). The program is patient-specific with main emphasis on the neurodevelopmental concept and on motor relearning strategies.
Number of participants	20
Duration of follow-up	3 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - Care described as being 'patient specific' Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No additional information

Study arms

Physiotherapy - </=45 minutes, 6 days a week (N = 10)
10 hours of additional trunk exercises over a period of 3 weeks. 10 hours in total, 45 minute sessions, 6 times a week for 3 weeks. This additional exercise consisted of selective movements of the upper and lower part of the trunk in supine and sitting including: Supine exercises, 1) bridging, 2) unilateral pelvic bridging, 3) trunk rotations. Sitting, 1) static sitting balance, 2) trunk flexion, 3) trunk lateral flexion, 4) trunk rotations (upper and lower), 5) weight shifts, 6) forward reach, 7) lateral reach, 8) perturbations. Concomitant therapy: Conventional multidisciplinary rehabilitation program (no information about amount of time). The program is patient-specific with main emphasis on the neurodevelopmental concept and on motor relearning strategies.

Usual care (N = 10)
Conventional program only. Concomitant therapy: Conventional multidisciplinary rehabilitation program (no information about amount of time). The program is patient-specific with main emphasis on the neurodevelopmental concept and on motor relearning strategies.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - </=45 minutes, 6 days a week (N = 10)**	**Usual care (N = 10)**
% Female Sample size	n = 5 ; % = 50	n = 3 ; % = 30
Mean age (SD) (years) Mean (SD)	59.5 (12.09)	57.8 (13.49)
Ethnicity	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - </=45 minutes, 6 days a week (N = 10)	Usual care (N = 10)
Sample size		
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	15 (6.16)	15.8 (10.69)
Type of communication difficulty Sample size	n = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 week (<6 months)

Physiotherapy - </=45 minutes, 6 days a week compared to usual care at <6 months - continuous outcome

Outcome	Physiotherapy - </=45 minutes, 6 days a week, Baseline, N = 10	Physiotherapy - </=45 minutes, 6 days a week, 3 week, N = 10	Usual care, Baseline, N = 10	Usual care, 3 week, N = 10
Physical function - lower limb (Trunk Impairment Scale) Scale range: 0-23. Final values. Mean (SD)	11.47 (2.3)	18.43 (1.1)	11.07 (1.95)	14.2 (1.5)

Physical function - lower limb (Trunk Impairment Scale) - Polarity - Higher values are better

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

Physiotherapy-</=45minutes,6daysaweekcomparedtousualcareat<6months-continuousoutcome-Physicalfunction-lowerlimb(TrunkImpairmentScale)-MeanSD-Physiotherapy - </=45 minutes, 6 days a week-Usual care-t3

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

Kuys, 2011

Bibliographic Reference	Kuys, Ss; Brauer, Sg; Ada, L; Higher-intensity treadmill walking during rehabilitation after stroke in feasible and not detrimental to walking pattern or quality: A pilot randomized trial; Clinical Rehabilitation; 2011; vol. 25 (no. 4); 316-26.

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	ACTRN12607000412437
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	Two rehabilitation units in Brisbane, Australia
Study dates	No additional information
Sources of funding	No additional information.
Inclusion criteria	A diagnosis of first stroke confirmed by computerized tomography scan; referred for physiotherapy rehabilitation and scored 2 or more on the walking item of the Motor Assessment Scale (i.e. were able to walk with stand-by help); were medically stable; were able to understand simple instructions; had a Mini-Mental State Exam score of at least 24.
Exclusion criteria	Walking speed was considered normal (>1.2m/s); cardiovascular problems that limited their participation in rehabilitation; had other neurological or musculoskeletal conditions affecting their walking.

Recruitment / selection of participants	No additional information.
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=15 Treadmill for 30 minutes (excluding rests), three times a week for six weeks, at an intensity of 40-60% heart rate reserve or a Borg Rating of Perceived Exertion of 11-14; the minimum required for training cardiorespiratory fitness. People commenced at an intensity level of 40% heart rate reserve for 30 minutes, progressing each week aiming for a 5-10% increase until 60% heart rate reserve was reached. While on the treadmill, participants were encouraged to hold the handrail and a physiotherapist provided assistance as required to ensure foot clearance during swing phase. In addition, an assistant was available to operate the controls and assist with safety and the safety stop cord was attached to participants at all times. If people were unable to walk for the entire 30 minutes, the actual intervention time was recorded. Concomitant therapy: Usual physiotherapy intervention, comprising approximately one hour per day of comprehensive therapy using a task-oriented approach targeting impairments and activity limitations specific to each participant.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=15 Usual physiotherapy intervention only. Concomitant therapy: Usual physiotherapy intervention, comprising approximately one hour per day of comprehensive therapy using a task-oriented approach targeting impairments and activity limitations specific to each participant.

Number of participants	30
Duration of follow-up	6 weeks (end of intervention), 18 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	Intention-to-treat analysis

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 15)
Treadmill for 30 minutes (excluding rests), three times a week for six weeks, at an intensity of 40-60% heart rate reserve or a Borg Rating of Perceived Exertion of 11-14; the minimum required for training cardiorespiratory fitness. People commenced at an intensity level of 40% heart rate reserve for 30 minutes, progressing each week aiming for a 5-10% increase until 60% heart rate reserve was reached. While on the treadmill, participants were encouraged to hold the handrail and a physiotherapist provided assistance as required to ensure foot clearance during swing phase. In addition, an assistant was available to operate the controls and assist with safety and the safety stop cord was attached to participants at all times. If people were unable to walk for the entire 30 minutes, the actual intervention time was recorded. Concomitant therapy: Usual physiotherapy intervention, comprising approximately one hour per

day of comprehensive therapy using a task-oriented approach targeting impairments and activity limitations specific to each participant.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)
Usual physiotherapy intervention only. Concomitant therapy: Usual physiotherapy intervention, comprising approximately one hour per day of comprehensive therapy using a task-oriented approach targeting impairments and activity limitations specific to each participant.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, 5 days a week (N = 15)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)**
% Female Sample size	n = 7 ; % = 50	n = 10 ; % = 66
Mean age (SD) (years) Mean (SD)	63 (14)	72 (17)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 15)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)
Sample size		
Time period since stroke (days) Mean (SD)	52 (32)	49 (30)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 18 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >1 to 2 hours, 5 days a week, 18 week, N = 12	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 18 week, N = 12
Physical function - lower limb (fast	0.52 (0.35)	0.36 (0.26)	0.73 (0.45)	0.12 (0.13)

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >1 to 2 hours, 5 days a week, 18 week, N = 12	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 18 week, N = 12
walking speed) (m/s) Change score Mean (SD)				

Physical function - lower limb (fast walking speed) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >1 to 2 hours, 5 days a week, 18 week, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 18 week, N = 15
Discontinuation Intervention: 1 withdrew, 1 fall, 1 moved, 1 medical condition. Control: 1 unable to be contacted, 1 medical condition, 1 moved. No of events	n = NA ; % = NA	n = 4 ; % = 26	n = NA ; % = NA	n = 3 ; % = 20

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(fastwalkingspeed)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t18

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t18

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

Kwakkel, 2016

Bibliographic Reference	Kwakkel, G; Winters, C; van, Wegen Ee; Nijland, Rh; van, Kuijk Aa; Visser-Meily, A; de, Groot J; de, Vlugt E; Arendzen, Jh; Geurts, Ac; Effects of unilateral upper limb training in two distinct prognostic, groups early after stroke: The EXPLICIT-stroke randomized clinical trial; Neurorehabilitation and Neural Repair; 2016; vol. 30 (no. 9); 804-16.

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	NTR: TC1424.
Study type	Randomised controlled trial (RCT)
Study location	The Netherlands
Study setting	Multicentre inpatient treatment
Study dates	October 2008 and November 2013
Sources of funding	The research leading to these results received funding from the Netherlands Organisation for Health Research and Development (ZonMw Grant No. 89000001) and was supported by the European Research Council (ERC) under the European Union's Seventh Framework Programme (FP/2007-2013)/ERC Grant Agreement no. 291339-4D-EEG and grants awarded to EW and CM from the Dutch Brain Foundation (de Hersenstichting).
Inclusion criteria	First-ever ischaemic stroke in one of the cerebral hemispheres; upper limb paresis according to National Institutes of Health Stroke Score (NIHSS) item 5; baseline ARAT score of at least 53 on a maximum of 57 points; ability to communicate and comprehend (Mini Mental State Examination at least 23 points on a maximum of 30 points); ability to sit independently for at least 30 seconds; 18 to 80 years of age; willing to participate in an intensive rehabilitation treatment program; written informed consent.

Exclusion criteria	Successful thrombolysis therapy resulting in upper limb motor recovering and attaining 0 points on NIHSS item 5 of the paretic arm; musculoskeletal impairments of the upper paretic limb; additional therapies such as botulinum toxin injections or medication intake that may influence upper limb function in the previous 3 months.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=29 Modified constraint induced movement therapy group daily with 60 minutes of supervised intensive graded practice focused on improving task-specific use of the paretic arm and hand, including enhancing finger extension. Therapy was delivered in either 1 session of split into 2 sessions of 30 minutes, depending on available time and patients' tolerance. Time between sessions per day was not controlled for. One hour of therapy was chosen to not overload patients in the early phase poststroke. People were instructed to wear padded safety mitts for 3 hours per working day, during 3 consecutive weeks and lasting up until 5 weeks poststroke. Concomitant therapy: Usual care consisted of exercise therapy based on recommendations from current Dutch guidelines, applied face-to-face by a physical therapist or occupational therapist for 30 minutes per working day executed for 3 consecutive weeks. A group of people (n=50) with an 'unfavourable prognosis' received EMG-NMS instead of modified constraint induced movement therapy. This group was not included in the analysis as they did not fulfil the inclusion criteria.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team

Comparator	Physiotherapy - </=45 minutes, 5 days a week N=29 Usual care only Concomitant therapy: Usual care consisted of exercise therapy based on recommendations from current Dutch guidelines, applied face-to-face by a physical therapist or occupational therapist for 30 minutes per working day executed for 3 consecutive weeks. A group of people (N=51) with an 'unfavourable prognosis' also received usual care. As this group was compared to only the EMG-NMS group, this group was not included in the analysis.
Number of participants	58 (favourable prognosis, 101 were included in the unfavourable prognosis group making 159 in total)
Duration of follow-up	5 weeks, 8 weeks, 12 weeks (<6 months), 26 weeks (≥6 months)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care - Therapy sessions could be split during the day according to therapist availability and the person's preference Intervention factors Individual therapy 'Homework'/self management interventions Environmental factors

	Hospital care
Additional comments	Intention-to-treat

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 29)
Modified constraint induced movement therapy group daily with 60 minutes of supervised intensive graded practice focused on improving task-specific use of the paretic arm and hand, including enhancing finger extension. Therapy was delivered in either 1 session of split into 2 sessions of 30 minutes, depending on available time and patients' tolerance. Time between sessions per day was not controlled for. One hour of therapy was chosen to not overload patients in the early phase poststroke. People were instructed to wear padded safety mitts for 3 hours per working day, during 3 consecutive weeks and lasting up until 5 weeks poststroke. Concomitant therapy: Usual care consisted of exercise therapy based on recommendations from current Dutch guidelines, applied face-to-face by a physical therapist or occupational therapist for 30 minutes per working day executed for 3 consecutive weeks.

Physiotherapy - </=45 minutes, 5 days a week (N = 29)
Usual care only Concomitant therapy: Usual care consisted of exercise therapy based on recommendations from current Dutch guidelines, applied face-to-face by a physical therapist or occupational therapist for 30 minutes per working day executed for 3 consecutive weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 29)	Physiotherapy - </=45 minutes, 5 days a week (N = 29)
% Female Sample size	n = 15 ; % = 52	n = 12 ; % = 41
Mean age (SD) (years) Mean (SD)	65.34 (11.36)	58.97 (14.05)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Mean (SD)	4.17 (2.04)	4.75 (2.14)
Time period since stroke (days) Mean (SD)	8.17 (4.28)	8.79 (4.13)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 12 week (<6 months)
- 26 week (≥6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 29	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 week, N = 29	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 29	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 29	Physiotherapy - </=45 minutes, 5 days a week, 12 week, N = 29	Physiotherapy - </=45 minutes, 5 days a week, 26 week, N = 29
Person/participant generic health-related quality of life (Stroke impact scale-hand) Scale range: 5-25. Final values. Mean (SD)	8.83 (5.17)	21.65 (2.98)	22.45 (3.02)	7.35 (3.86)	18.71 (6.97)	20.04 (6.38)
Physical function - upper limb (Fugl Meyer Assessment-Upper Extremity) Scale range: 0-66. Final values. Mean (SD)	42.93 (14.6)	60.63 (6.64)	60.69 (5.36)	35.64 (15.03)	56.27 (12.25)	57.48 (12.78)

Person/participant generic health-related quality of life (Stroke impact scale-hand) - Polarity - Higher values are better

Physical function - upper limb (Fugl Meyer Assessment-Upper Extremity) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 29	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 12 week, N = 29	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 26 week, N = 29	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 29	Physiotherapy - </=45 minutes, 5 days a week, 12 week, N = 29	Physiotherapy - </=45 minutes, 5 days a week, 26 week, N = 29
Discontinuation Intervention = 0. Control = 1 died, 1 withdrew. No of events	n = NA ; % = NA	n = 2 ; % = 7	n = 2 ; % = 7	n = NA ; % = NA	n = 0 ; % = 0	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(Strokeimpactscale-hand)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t12

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(Strokeimpactscale-hand)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t26

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment-UpperExtremity)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t12

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment-UpperExtremity)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t26

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t12

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t26

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

Lee, 2014

Bibliographic Reference	Lee, Ch; Kim, Y; Lee, Bh; Augmented reality-based postural control training improves gait function in patients with stroke: Randomized controlled trial; Hong Kong Physiotherapy Journal; 2014; vol. 32 (no. 2); 51-7.

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	No additional information
Study dates	No additional information
Sources of funding	All authors declare that they have no conflicts of interest
Inclusion criteria	A diagnosis of stroke for at least 6 months (chronic stroke); sitting or sideling with moderate assistance; sitting for longer than 10 seconds without support; standing without support for 1 minute.
Exclusion criteria	Taking medication that can affect balance; Mini-Mental State Examination score <24; pain or disability associated with acute musculoskeletal conditions; Pusher syndrome.

Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=10 Additional augmented reality-based postural control training for 30 minutes per day, 3 days per week for a period of 4 weeks in addition to conventional therapy. Augmented reality-based postural control training consisted of three stages and 16 subordinate scopes. The first stage includes six subordinated exercise programs that were conducted without the use of any tool in a lying position. The second stage involved four subordinated exercise programs performed while sitting. The third stage consisted of six subordinated exercise programs in the standing position performed using a therapeutic ball or a foothold. The augmented reality environment was implemented using a server computer mounted with a camera and a Super Video Graphics Array head-mounted display consisting of a 800x600 resolution display connected to an ultra-mobile personal computer. The two computers were installed for wireless exchange of signals. The virtual reality device used in the augmented reality system included videos of postural control training for guiding the stroke patients to perform ideal postural control motions. The HMD was designed to show two views. The modelled movement was shown on the individual's side and the actual movement was shown on the other side. The patient could watch the modelled movement and listen to a recorded sound, in order to compare the normal movement with his/her own movement. The augmented reality training was designed to be adjustable to the person's ability to move and to ensure safety. In addition, after putting on the head mounted display, the patients were given 5 minutes to familiarize themselves with the augmented reality program before the commencement of the experiment. Concomitant therapy: General physical therapy program for a duration of 30 minutes per session, 5 days per week, for a period of 4 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Not stated/unclear
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists

Comparator	Physiotherapy - </=45 minutes, 5 days a week N=11 General physical therapy only. Concomitant therapy: General physical therapy program for a duration of 30 minutes per session, 5 days per week, for a period of 4 weeks.
Number of participants	21
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Need for technical support and training Environmental factors Use of expensive equipment

Additional comments	Intention-to-treat

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 10)
Additional augmented reality-based postural control training for 30 minutes per day, 3 days per week for a period of 4 weeks in addition to conventional therapy. Augmented reality-based postural control training consisted of three stages and 16 subordinate scopes. The first stage includes six subordinated exercise programs that were conducted without the use of any tool in a lying position. The second stage involved four subordinated exercise programs performed while sitting. The third stage consisted of six subordinated exercise programs in the standing position performed using a therapeutic ball or a foothold. The augmented reality environment was implemented using a server computer mounted with a camera and a Super Video Graphics Array head-mounted display consisting of a 800x600 resolution display connected to an ultra-mobile personal computer. The two computers were installed for wireless exchange of signals. The virtual reality device used in the augmented reality system included videos of postural control training for guiding the stroke patients to perform ideal postural control motions. The HMD was designed to show two views. The modelled movement was shown on the individual's side and the actual movement was shown on the other side. The patient could watch the modelled movement and listen to a recorded sound, in order to compare the normal movement with his/her own movement. The augmented reality training was designed to be adjustable to the person's ability to move and to ensure safety. In addition, after putting on the head mounted display, the patients were given 5 minutes to familiarize themselves with the augmented reality program before the commencement of the experiment. Concomitant therapy: General physical therapy program for a duration of 30 minutes per session, 5 days per week, for a period of 4 weeks.

Physiotherapy - </=45 minutes, 5 days a week (N = 11)
General physical therapy only. Concomitant therapy: General physical therapy program for a duration of 30 minutes per session, 5 days per week, for a period of 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 10)	Physiotherapy - </=45 minutes, 5 days a week (N = 11)
% Female Sample size	n = 2 ; % = 20	n = 5 ; % = 45.5
Mean age (SD) (years) Mean (SD)	47.9 (12)	54 (11.9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	11.7 (4.5)	11 (4.7)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 10	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 11	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 11
Physical function - lower limb (Berg Balance Score) Scale range: 0-56. Final values. Mean (SD)	45.8 (5.6)	49.9 (6)	40.7 (5.7)	42.4 (6.3)

Physical function - lower limb (Berg Balance Score) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 10	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 11	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 11
Discontinuation Intervention: 2 dropouts. Control: 1 dropout. Reasons not provided.	n = NA ; % = NA	n = 2 ; % = 20	n = NA ; % = NA	n = 1 ; % = 9

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 10	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 11	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 11
No of events				

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScore)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Lee, 2013

Bibliographic Reference	Lee, G.; Effects of training using video games on the muscle strength, muscle tone, and activities of daily living of chronic stroke patients; Journal of Physical Therapy Science; 2013; vol. 25 (no. 5); 595-7

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Inpatient
Study dates	No additional information
Sources of funding	This work was supported by Kyungnam University Foundation Grant, 2012.

Inclusion criteria	>6 months after stroke onset; no problems with auditory or visual functioning; a Mini-Mental State Examination score of >24).
Exclusion criteria	People with unstable blood pressure or angina; a history of seizure; people who refused to use the video game.
Recruitment / selection of participants	Inpatients recovering in stroke rehabilitation
Intervention(s)	Occupational therapy - >45 minutes to 1 hour, <5 days a week N=7 Video games played on the Xbox Kinect together with conventional occupational therapy for 6 weeks (1 hour/day, 3 days/week). The Xbox Kinect (Xbox 360, Microsoft, US) was used for training. Xbox Kinect has an infrared camera sensor that recognizes user movements without a controller. For the training, the screen and beam projector were set in a room that was not influenced by external factors. The infrared camera was located in the front of the screen, and the subjects were asked to sit or stand. The programs used for training, the Kinect sports (Boxing and Bowling) and Kinect adventure (Rally Ball, 20,000 Leaks, and Space Pop), were chosen by the researcher. Two games of each program were selected by the participants according to their interest. Two games were played for 15 minutes each, for a total of 30 minutes. Concomitant therapy: Conventional occupational therapy focused on upper extremity function and activities of daily living. That was performed for 30 minutes.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - </=45 minutes, <5 days a week N=7 Conventional occupational therapy only.

	Concomitant therapy: Conventional occupational therapy focused on upper extremity function and activities of daily living. That was performed for 30 minutes.
Number of participants	14
Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information on method of analysis (does not state that anyone discontinued, so possibly ITT no discontinuation)

Study arms

Occupational therapy - >45 minutes to 1 hour, <5 days a week (N = 7)
Video games played on the Xbox Kinect together with conventional occupational therapy for 6 weeks (1 hour/day, 3 days/week). The Xbox Kinect (Xbox 360, Microsoft, US) was used for training. Xbox Kinect has an infrared camera sensor that recognizes user movements without a controller. For the training, the screen and beam projector were set in a room that was not influenced by external factors. The infrared camera was located in the front of the screen, and the subjects were asked to sit or stand. The programs used for training, the Kinect sports (Boxing and Bowling) and Kinect adventure (Rally Ball, 20,000 Leaks, and Space Pop), were chosen by the researcher. Two games of each program were selected by the participants according to their interest. Two games were played for 15 minutes each, for a total of 30 minutes. Concomitant therapy: Conventional occupational therapy focused on upper extremity function and activities of daily living. That was performed for 30 minutes.

Occupational therapy - </=45 minutes, <5 days a week (N = 7)
Conventional occupational therapy only. Concomitant therapy: Conventional occupational therapy focused on upper extremity function and activities of daily living. That was performed for 30 minutes.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >45 minutes to 1 hour, <5 days a week (N = 7)	Occupational therapy - </=45 minutes, <5 days a week (N = 7)
% Female Sample size	n = 3 ; % = 43	n = 2 ; % = 29
Mean age (SD) (years) Mean (SD)	71.71 (9.14)	76.43 (5.8)

Characteristic	Occupational therapy - >45 minutes to 1 hour, <5 days a week (N = 7)	Occupational therapy - </=45 minutes, <5 days a week (N = 7)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	7.29 (1.38)	8.29 (3.4)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Occupational therapy - >45 minutes to 1 hour, <5 days a week compared to Occupational therapy - </=45 minutes, <5 days a week at <6 months - continuous outcome

Outcome	Occupational therapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 7	Occupational therapy - >45 minutes to 1 hour, <5 days a week, 6 week, N = 7	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 7	Occupational therapy - </=45 minutes, <5 days a week, 6 week, N = 7
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	62.71 (11.48)	71.42 (15)	56.43 (9.85)	61.24 (11.93)

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

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

Occupationaltherapy->45minutesto1hour,<5daysaweekcomparedtoOccupationaltherapy-</=45minutes,<5daysaweekat<6months-continuousoutcome-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >45 minutes to 1 hour, <5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t6

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

Lee, 2012

Bibliographic Reference	Lee, S. H.; Byun, S. D.; Kim, C. H.; Go, J. Y.; Nam, H. U.; Huh, J. S.; Feasibility and Effects of Newly Developed Balance Control Trainer for Mobility and Balance in Chronic Stroke Patients: a Randomized Controlled Trial; Annals of rehabilitation medicine; 2012; vol. 36 (no. 4); 521-529

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	No additional information
Study dates	March 2010 and February 2011.
Sources of funding	No additional information

Inclusion criteria	The patients at six months or greater after the stroke; the first episode of unilateral stroke (infarction, haemorrhage) with hemiparesis, in the territory of the internal carotid artery; the diagnosis of stroke confirmed by computer tomography or magnetic resonance imaging; the ability to understand and follow simple verbal instructions; was ambulatory before onset of stroke; the ability to walk 10 meters independently
Exclusion criteria	Medically unstable or had a history of musculoskeletal conditions affecting lower limbs or neurological diseases affecting vision, gait, balance, conscious or cognitive level (Mini-Mental State Examination <24).
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=20 Training with a balance control trainer for 20 minutes a day, 5 days a week for 4 weeks in addition to concurrent conventional therapy. First, a self-weight shifting exercise was performed in both the horizontal and vertical plane with visual feedback that was provided for 10 minutes. People were asked to stand on both feet and load as much weight as possible on the affected side without losing balance for the first 5 minutes. The distribution of weight on the left and right sides was monitored continuously during this time. During the next 5 minutes, people were also asked to repetitively flex and extend the knee as far as they could on the affected side while still bearing weight as much weight as is possible on that side. Second, weight shifting exercise with the video game (board cleaner game) were performed for the next 10 minutes. The game lasted for 2 minutes and was played 5 times. In the board cleaner game, an eraser would move left and right on the screen according to the horizontal weight shift to erase an image on the screen. The eraser would move vertically in response to knee flexion and extension. A 20-degree toe-out stance on the electronic scales and maximum plantar contact with the scales were maintained at all times in order to minimize rotation of the lower limb. Concomitant therapy: Conventional physical therapy, 1 hour a day, 5 days a week for 4 weeks.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=20 Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 1 hour a day, 5 days a week for 4 weeks.
Number of participants	40
Duration of follow-up	2 weeks and 4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care Use of expensive equipment

Additional comments	No additional information on method of analysis (possibly ITT where no people discontinued)

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 20)
Training with a balance control trainer for 20 minutes a day, 5 days a week for 4 weeks in addition to concurrent conventional therapy. First, a self-weight shifting exercise was performed in both the horizontal and vertical plane with visual feedback that was provided for 10 minutes. People were asked to stand on both feet and load as much weight as possible on the affected side without losing balance for the first 5 minutes. The distribution of weight on the left and right sides was monitored continuously during this time. During the next 5 minutes, people were also asked to repetitively flex and extend the knee as far as they could on the affected side while still bearing weight as much weight as is possible on that side. Second, weight shifting exercise with the video game (board cleaner game) were performed for the next 10 minutes. The game lasted for 2 minutes and was played 5 times. In the board cleaner game, an eraser would move left and right on the screen according to the horizontal weight shift to erase an image on the screen. The eraser would move vertically in response to knee flexion and extension. A 20-degree toe-out stance on the electronic scales and maximum plantar contact with the scales were maintained at all times in order to minimize rotation of the lower limb. Concomitant therapy: Conventional physical therapy, 1 hour a day, 5 days a week for 4 weeks.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 20)
Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 1 hour a day, 5 days a week for 4 weeks.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 20)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 20)
% Female Sample size	n = 7 ; % = 35	n = 8 ; % = 40
Mean age (SD) (years) Mean (SD)	53.75 (11.29)	54.1 (11.13)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	13.3 (5.89)	14 (6.34)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 20	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 20	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 20
Activities of daily living (Modified Barthel Index) Scale range: 0-100. Final values. Mean (SD)	64 (17)	70.4 (18)	65.6 (13.5)	68.1 (12.6)
Physical function - lower limb (Berg Balance Scale) Scale range: 0-56. Final values. Mean (SD)	39.8 (8.7)	45.7 (7.8)	40 (6.8)	41.7 (6.9)

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better
Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 20	Physiotherapy - >1 to 2 hours, 5 days a week, 4 week, N = 20	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 20
Discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(ModifiedBarthelIndex)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Lin, 2020

Bibliographic Reference	Lin, R. C.; Chiang, S. L.; Heitkemper, M. M.; Weng, S. M.; Lin, C. F.; Yang, F. C.; Lin, C. H.; Effectiveness of Early Rehabilitation Combined With Virtual Reality Training on Muscle Strength, Mood State, and Functional Status in Patients With Acute Stroke: A Randomized Controlled Trial; Worldviews on Evidence-Based Nursing; 2020; vol. 17 (no. 2); 158-167

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Taiwan
Study setting	Neurological care ward of a Taiwanese medical center
Study dates	March 2017 to March 2018
Sources of funding	Funded by the Tri-Service General Hospital (TSGH-C106-128), Taipei, Taiwan.
Inclusion criteria	Hospitalised patients diagnosed with acute infarction (ischaemic, e.g., large artery atherosclerosis, cardioembolism, and small vessel occlusion [lacuna]) stroke; admitted to hospital within 3 days after onset of stroke; age greater than 20 years; able to communicate with verbal or nonverbal methods and understand Mandarin; had disability that ranged from minimal (e.g., able to execute all usual duties and activities) to moderately severe disability and evaluated as 1-4 scores by the modified Rankin Scale, which measures the degree of disability or dependence; agreed to be randomized.
Exclusion criteria	Diagnosis of global aphasia or transient ischaemic attack, visual or auditory impairment; modified Rankin scale at least 5 (severe disability: required constant nursing care and attention, bedridden, incontinent); a history of cancer, end-stage renal

	disease with dialysis, dementia, mental health disorders (particularly major depression), based on both of medical records and assessments from the neurologist; patients transferred from other wards; being unable to participate due to other comorbid neurological and musculoskeletal conditions that produce moderate-to-severe physical disability; prolonged stay in hospital for over 3 weeks due to other medical diseases (e.g., myocardial infarction, septic shock, cancer) after admission; length of stay in hospital less than 1 week due to a decline to treatment and transfer to another hospital for further confirmation of diagnosis and other complementary and alternative therapies.
Recruitment / selection of participants	People recruited consecutively by a research assistant from the neurological care ward of a Taiwanese medical center from March 2017 through March 2018.
Intervention(s)	Multidisciplinary team - >1 to 2 hours, 5 days a week N=38 Extra 5 days of supervised virtual reality training (15 minutes of time, 2 times per day). The wireless virtual reality device, Kinect sensor, training was conducted in a private room on the neurological care ward. The virtual reality sessions were performed by two stroke care experienced registered nurses and researchers (the first and fourth co-author), who have more than 20 years of experience in neurological patient care. They received 4 weeks of training (8 hours per week) with the virtual reality devices by a senior engineer of Longgood Company. The virtual reality training was implemented following a protocol designed by the research team and engineer to ensure the veracity of the virtual reality training delivered. Each patient was sent to the room individually to receive one-to-one supervised training. The device captures full-body images, projects it to the monitor in real time, allows the patient to be immersed in the VR scene, and interacts with 3-D virtual environments and objects. The 11 virtual reality training sessions, such as training for muscle strength of upper extremities, cognition, coordination and muscle strength of lower extremities, were performed for approximately 5 minutes and categorized into four programmes (range of motion and coordination training; range of motion and upper limb strengthening exercises; strengthening exercises for lower limbs, trunk stabilization and balance; and cognition training). During the training, the challenge level progressively increased by adjusting the amplitude, speed, frequency, complexity and number of hints. Concomitant therapy: Conventional therapy comprise of standardised stroke care and early rehabilitation (i.e., postural training, facilitation techniques, stretching exercise and strengthening exercise) performed on the neurological care ward. The early rehabilitation (five 60-minute sessions per week), prescribed by a rehabilitation physician, was performed at 3 to 6 days after admission by the physical, occupational and speech therapists at the rehabilitation department. The time of

	initiation of early rehabilitation (days 1 to 2) was based on input from the rehabilitation physician, assessments by physical, occupational and speech therapists, and availability of rehabilitation schedules
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week N=114 Conventional therapy only. >45 minutes to 1 hour, 5 days a week until discharge (between 7 and 21 days). Concomitant therapy: Conventional therapy comprise of standardised stroke care and early rehabilitation (i.e., postural training, facilitation techniques, stretching exercise and strengthening exercise) performed on the neurological care ward. The early rehabilitation (five 60-minute sessions per week), prescribed by a rehabilitation physician, was performed at 3 to 6 days after admission by the physical, occupational and speech therapists at the rehabilitation department. The time of initiation of early rehabilitation (days 1 to 2) was based on input from the rehabilitation physician, assessments by physical, occupational and speech therapists, and availability of rehabilitation schedules
Number of participants	152
Duration of follow-up	7-21 days (on discharge/end of intervention). An average of 14 days will be used in the later timepoint.
Indirectness	No additional information
Elements of the study relating to qualitative themes	Individual therapy Telerehabilitation, assistive technology and computer-based tools

	Need for technical support and training Physical environment - required an individual room Environmental factors Hospital care Use of expensive equipment
Additional comments	Intention to treat

Study arms

Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 38)
Extra 5 days of supervised virtual reality training (15 minutes of time, 2 times per day). The wireless virtual reality device, Kinect sensor, training was conducted in a private room on the neurological care ward. The virtual reality sessions were performed by two stroke care experienced registered nurses and researchers (the first and fourth co-author), who have more than 20 years of experience in neurological patient care. They received 4 weeks of training (8 hours per week) with the virtual reality devices by a senior engineer of Longgood Company. The virtual reality training was implemented following a protocol designed by the research team and engineer to ensure the veracity of the virtual reality training delivered. Each patient was sent to the room individually to receive one-to-one supervised training. The device captures full-body images, projects it to the monitor in real time, allows the patient to be immersed in the VR scene, and interacts with 3-D virtual environments and objects. The 11 virtual reality training sessions, such as training for muscle strength of upper extremities, cognition, coordination and muscle strength of lower extremities, were performed for approximately 5 minutes and categorized into four programmes (range of motion and coordination training; range of motion and upper limb strengthening exercises; strengthening exercises for lower limbs, trunk stabilization and balance; and cognition training).

During the training, the challenge level progressively increased by adjusting the amplitude, speed, frequency, complexity and number of hints. Concomitant therapy: Conventional therapy comprise of standardised stroke care and early rehabilitation (i.e., postural training, facilitation techniques, stretching exercise and strengthening exercise) performed on the neurological care ward. The early rehabilitation (five 60-minute sessions per week), prescribed by a rehabilitation physician, was performed at 3 to 6 days after admission by the physical, occupational and speech therapists at the rehabilitation department. The time of initiation of early rehabilitation (days 1 to 2) was based on input from the rehabilitation physician, assessments by physical, occupational and speech therapists, and availability of rehabilitation schedules

Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 114)
Conventional therapy only. >45 minutes to 1 hour, 5 days a week until discharge (between 7 and 21 days). Concomitant therapy: Conventional therapy comprise of standardised stroke care and early rehabilitation (i.e., postural training, facilitation techniques, stretching exercise and strengthening exercise) performed on the neurological care ward. The early rehabilitation (five 60-minute sessions per week), prescribed by a rehabilitation physician, was performed at 3 to 6 days after admission by the physical, occupational and speech therapists at the rehabilitation department. The time of initiation of early rehabilitation (days 1 to 2) was based on input from the rehabilitation physician, assessments by physical, occupational and speech therapists, and availability of rehabilitation schedules

Characteristics

Arm-level characteristics

Characteristic	**Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 38)**	**Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 114)**
% Female Sample size	n = 11 ; % = 28.9	n = 47 ; % = 43.9
Mean age (SD) (years) Mean (SD)	64.5 (13.5)	66.9 (13.3)

Characteristic	Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 38)	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 114)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Hypertension Sample size	n = 25 ; % = 65.8	n = 77 ; % = 72
Type 2 diabetes Sample size	n = 13 ; % = 34.2	n = 42 ; % = 39.3
Heart disease Sample size	n = 11 ; % = 28.9	n = 36 ; % = 33.6
Lipidemia Sample size	n = 22 ; % = 57.9	n = 62 ; % = 57.9
Metabolic syndrome Sample size	n = 9 ; % = 23.7	n = 25 ; % = 23.4
Severity Modified Rankin Scale Mean (SD)	2.9 (1.2)	2.9 (1.2)

Characteristic	Multidisciplinary team - >1 to 2 hours, 5 days a week (N = 38)	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week (N = 114)
Time period since stroke (days) Mean (SD)	3.7 (0.8)	3.8 (0.8)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 14 day (7-21 days. <6 months.)

Multidisciplinary team - >1 to 2 hours, 5 days a week compared to Multidisciplinary team - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 38	Multidisciplinary team - >1 to 2 hours, 5 days a week, 14 day, N = 38	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 107	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 14 day, N = 107
Activities of daily living (barthel index) Scale range: 0-100. Final values. Mean (SD)	59.7 (24.6)	73.4 (22.2)	60 (29.6)	71 (29)

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 38	Multidisciplinary team - >1 to 2 hours, 5 days a week, 14 day, N = 38	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 107	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 14 day, N = 107
Physical function - lower limb (Postural Assessment Scale for Stroke) Scale range: 0-36. Final values. Mean (SD)	21.8 (11.6)	26.8 (10.1)	23.4 (12)	26.8 (11.8)
Psychological distress - Depression (HADS depression) Scale range: 0-21. Final values. Mean (SD)	12.1 (2.5)	9.3 (3.2)	10.3 (4.8)	10 (4.5)

Activities of daily living (barthel index) - Polarity - Higher values are better
Physical function - lower limb (Postural Assessment Scale for Stroke) - Polarity - Higher values are better
Psychological distress - Depression (HADS depression) - Polarity - Lower values are better

Multidisciplinary team - >1 to 2 hours, 5 days a week compared to Multidisciplinary team - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 38	Multidisciplinary team - >1 to 2 hours, 5 days a week, 14 day, N = 38	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 107	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 14 day, N = 107
Discontinuation Intervention: 0. Control: 2 transferred to intensive care	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 9 ; % = 8

Outcome	Multidisciplinary team - >1 to 2 hours, 5 days a week, Baseline, N = 38	Multidisciplinary team - >1 to 2 hours, 5 days a week, 14 day, N = 38	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, Baseline, N = 107	Multidisciplinary team - >45 minutes to 1 hour, 5 days a week, 14 day, N = 107
unit, 7 dropped out before complete baseline assessment. No of events				

Discontinuation - Polarity - Lower values are better

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(barthelindex)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t14

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-PhysicalfunctionlowerlimbPosturalAssessmentScaleforStroke)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t14

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Psychologicaldistress-Depression(HADSdepression)-MeanSD-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t14

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

Multidisciplinaryteam->1to2hours,5daysaweekcomparedtoMultidisciplinaryteam->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Multidisciplinary team - >1 to 2 hours, 5 days a week-Multidisciplinary team - >45 minutes to 1 hour, 5 days a week-t14

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

Long, 2020

Bibliographic Reference	Long, Y.; Ouyang, R. G.; Zhang, J. Q.; Effects of virtual reality training on occupational performance and self-efficacy of patients with stroke: a randomized controlled trial; Journal of Neuroengineering & Rehabilitation; 2020; vol. 17 (no. 1); 150

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	ChiCTR1900026550
Study type	Randomised controlled trial (RCT)
Study location	China
Study setting	Outpatient and inpatient care at a large acute hospital in Changsha, China.
Study dates	October 2019 to March 2020.

Sources of funding	This study was supported by Clinical Medical Technology Innovation Guidance Project of Hunan Province Technology Innovation Guidance Program (No. 2017SK50113). Funding agencies could provide appropriate financial support for data collection and manuscript polishing.
Inclusion criteria	Diagnosis of first-ever stroke (onset time at least 1 year); ability to follow verbal instruction (Mini-Mental State Evaluation score of at least 24 points); an adjusted cut-off value of 17 was used for participants with formal education years <6; the muscle tone of upper limb evaluated by modified Ashworth scale <2; proximal upper limb strength assessed by manual muscle test at least 2; no visual field deficit or hemianopia.
Exclusion criteria	Bilateral hemispheric stroke; severe cardiopulmonary diseases; other medical diseases that could affect their capacity to do rehabilitative training
Recruitment / selection of participants	People were recruited consecutively at a large acute hospital in Changsha, China, from October 2019 to March 2020.
Intervention(s)	Occupational therapy - >1 hour to 2 hours, 5 days a week N=30 Virtual reality - additional 45 minutes virtual reality training, 5 times per week over 3 weeks. The main component of the VR-based game system was a touch controlled computer screen, which was used to input basic information, assess participants' range of motion, and set personalised prescriptions. Infrared sensor smart recognition camera was used to track the range of joint movement, mainly that of large joints (shoulder and elbow). The camera sensor could capture the movements of the participant at a distance between 1.5 and 3.0 meters. A human-shaped model on the computer screen demonstrated the required joint movements before the training, as well as some game actions. Participants must follow the actions of the human-shaped model to complete tasks one by one. Before training, each participant was evaluated for active range of motion, including flexion, extension, adduction and abduction of shoulder joint. The virtual reality games contained five tasks: bilateral upper limb flexion; abduction activity (20 times per activity); gold coins picking game, including shoulder circle; cross and mixed training for 3-5 minutes. The training difficult and intensity were adjusted according to the participant's ability. To prevent falls, therapists stood behind the participant for safety and guidance, and the participant was allowed to grab the handrail, if necessary. Concomitant therapy: Both groups received dose-matched conventional rehabilitation (i.e., 45 minutes, 5 times per week, over 3 weeks). Both groups received the same dosage of conventional therapy, which included occupational therapy, physical therapy and acupuncture.

Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - </=45 minutes, 5 days a week N=30 Conventional rehabilitation only. Concomitant therapy: Both groups received dose-matched conventional rehabilitation (i.e., 45 minutes, 5 times per week, over 3 weeks). Both groups received the same dosage of conventional therapy, which included occupational therapy, physical therapy and acupuncture.
Number of participants	60
Duration of follow-up	3 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools

	Environmental factors Hospital care Use of expensive equipment
Additional comments	Intention-to-treat

Study arms

Occupational therapy - >1 hour to 2 hours, 5 days a week (N = 30)
Virtual reality - additional 45 minutes virtual reality training, 5 times per week over 3 weeks. The main component of the VR-based game system was a touch controlled computer screen, which was used to input basic information, assess participants' range of motion, and set personalised prescriptions. Infrared sensor smart recognition camera was used to track the range of joint movement, mainly that of large joints (shoulder and elbow). The camera sensor could capture the movements of the participant at a distance between 1.5 and 3.0 meters. A human-shaped model on the computer screen demonstrated the required joint movements before the training, as well as some game actions. Participants must follow the actions of the human-shaped model to complete tasks one by one. Before training, each participant was evaluated for active range of motion, including flexion, extension, adduction and abduction of shoulder joint. The virtual reality games contained five tasks: bilateral upper limb flexion; abduction activity (20 times per activity); gold coins picking game, including shoulder circle; cross and mixed training for 3-5 minutes. The training difficult and intensity were adjusted according to the participant's ability. To prevent falls, therapists stood behind the participant for safety and guidance, and the participant was allowed to grab the handrail, if necessary. Concomitant therapy: Both groups received dose-matched conventional rehabilitation (i.e., 45 minutes, 5 times per week, over 3 weeks). Both groups received the same dosage of conventional therapy, which included occupational therapy, physical therapy and acupuncture.

Occupational therapy - </=45 minutes, 5 days a week (N = 30)
Conventional rehabilitation only. Concomitant therapy: Both groups received dose-matched conventional rehabilitation (i.e., 45 minutes, 5 times per week, over 3 weeks). Both groups received the same dosage of conventional therapy, which included occupational therapy, physical therapy and acupuncture.

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - >1 hour to 2 hours, 5 days a week (N = 30)**	**Occupational therapy - </=45 minutes, 5 days a week (N = 30)**
% Female Sample size	n = 7 ; % = 28	n = 11 ; % = 41
Mean age (SD) (years) Mean (SD)	53.28 (15.3)	54.11 (14.81)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Median (IQR)	20 (9 to 45.5)	8 (6 to 15)

Characteristic	Occupational therapy - >1 hour to 2 hours, 5 days a week (N = 30)	Occupational therapy - </=45 minutes, 5 days a week (N = 30)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 week (<6 months)

Occupational therapy - >1 hour to 2 hours, 5 days a week compared to Occupational therapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Occupational therapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 30	Occupational therapy - >1 hour to 2 hours, 5 days a week, 3 week, N = 30	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 30	Occupational therapy - </=45 minutes, 5 days a week, 3 week, N = 30
Discontinuation Intervention: 2 lost to follow up, 1 medical withdrawal, 2 voluntary withdrawal. Control: 1 lost to follow up, 1 medical withdrawal, 1 voluntary withdrawal No of events	n = NA ; % = NA	n = 5 ; % = 17	n = NA ; % = NA	n = 3 ; % = 10

Discontinuation - Polarity - Lower values are better

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

Occupational therapy->1hourto2hours,5daysaweekcomparedtoOccupational therapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - >1 hour to 2 hours, 5 days a week-Occupational therapy - </=45 minutes, 5 days a week-t3

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

Majumdar, 2019

Bibliographic Reference	Majumdar, S.; Morris, R.; Brief group-based acceptance and commitment therapy for stroke survivors; British Journal of Clinical Psychology; 2019; vol. 58 (no. 1); 70-90

Study details

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

this study included in review	
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	Libraries (community setting)
Study dates	No additional information
Sources of funding	This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors
Inclusion criteria	At least one clinically diagnosed stroke; were discharged from hospital; were over 18 years old; did not have severe communication difficulties (e.g. aphasia) or cognitive impairments
Exclusion criteria	Another acquired brain injury (e.g., traumatic brain injury, encephalitis, tumours); a diagnosed degenerative condition (e.g., dementia); a severe mental illness (e.g., psychosis).
Recruitment / selection of participants	People were recruited from advertisements to members of stroke clinical teams across three NHS sites in South Wales and the south west of England.
Intervention(s)	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week N=26 'ACTivate Your Life after Stroke' intervention, consisting of 2 hour weekly didactic PowerPoint group sessions for four consecutive weekly. In sessions 1 and 4, an extra half an hour was allocated for study questionnaire completion. Due to the trans-diagnostic nature of ACT, carers were invited to the course but were not part of the study analysis. As the intervention was didactic and non-interactive, the presence of carers was not expected to inhibit the survivors, but it may have enhanced confidence and sense of support. The material was manualized and psychoeducational in nature, delivered by Microsoft PowerPoint with several ACT-based individual activities throughout, such as guided mindfulness practices. The

	mental health version of the course was adapted for stroke in collaboration with stroke survivors and carers. Changes included reducing contrasting colours, simplifying the language and number of words on the slides, and inclusion of stroke specific examples. The modified version was used across all four sites. Courses were run in community venues, for example, libraries across four sites. Sessions had at least two facilitators consisting of clinical psychologists, assistant psychologists, or stroke care co-ordinators. There was at least one clinical psychologist within the presenting team at each site. To ensure fidelity, all of the course facilitators received the same intensive 2 day training. Concomitant therapy: All people had access to usual treatments should they choose, including community services such as GP, charity support or online resources.
Intervention stratification - Type of therapist	Cognitive therapy/psychological therapy
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Cognition

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Clinical Neuropsychologist
Comparator	Usual care N=27 Usual care only (no information about amount of time of therapy received) Concomitant therapy: All people had access to usual treatments should they choose, including community services such as GP, charity support or online resources.
Number of participants	53
Duration of follow-up	2 months
Indirectness	No additional information

Elements of the study relating to qualitative themes	Intervention factors Group-based therapy
Additional comments	Intention to treat

Study arms

Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week (N = 26)
'ACTivate Your Life after Stroke' intervention, consisting of 2 hour weekly didactic PowerPoint group sessions for four consecutive weekly. In sessions 1 and 4, an extra half an hour was allocated for study questionnaire completion. Due to the trans-diagnostic nature of ACT, carers were invited to the course but were not part of the study analysis. As the intervention was didactic and non-interactive, the presence of carers was not expected to inhibit the survivors, but it may have enhanced confidence and sense of support. The material was manualized and psychoeducational in nature, delivered by Microsoft PowerPoint with several ACT-based individual activities throughout, such as guided mindfulness practices. The mental health version of the course was adapted for stroke in collaboration with stroke survivors and carers. Changes included reducing contrasting colours, simplifying the language and number of words on the slides, and inclusion of stroke specific examples. The modified version was used across all four sites. Courses were run in community venues, for example, libraries across four sites. Sessions had at least two facilitators consisting of clinical psychologists, assistant psychologists, or stroke care co-ordinators. There was at least one clinical psychologist within the presenting team at each site. To ensure fidelity, all of the course facilitators received the same intensive 2 day training. Concomitant therapy: All people had access to usual treatments should they choose, including community services such as GP, charity support or online resources.

Usual care (N = 27)
Usual care only (no information about amount of time of therapy received) Concomitant therapy: All people had access to usual treatments should they choose, including community services such as GP, charity support or online resources.

Characteristics

Arm-level characteristics

Characteristic	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week (N = 26)	Usual care (N = 27)
% Female Sample size	n = 5 ; % = 19	n = 16 ; % = 59
Mean age (SD) (years) Mean (SD)	65.3 (*empty data*)	60 (15.6)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	14.1 (14.5)	13.1 (13.3)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 2 month (<6 months)

Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week compared to usual care at <6 months - continuous outcomes

Outcome	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 26	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week, 2 month, N = 26	Usual care, Baseline, N = 27	Usual care, 2 month, N = 27
Person/participant generic health-related quality of life (EQ-5D-5L) Scale range: -0.11-1. Final values. Mean (SD)	0.65 (0.26)	0.65 (0.26)	0.61 (0.28)	0.7 (0.19)
Psychological distress - Depression (PHQ-9) Scale range: 0-27. Final values. Mean (SD)	12.46 (6.3)	8.27 (6.5)	10.85 (7.5)	9.74 (7.4)

Person/participant generic health-related quality of life (EQ-5D-5L) - Polarity - Higher values are better
Psychological distress - Depression (PHQ-9) - Polarity - Lower values are better

Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week compared to usual care at <6 months - dichotomous outcome

Outcome	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 26	Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week, 2 month, N = 26	Usual care, Baseline, N = 27	Usual care, 2 month, N = 27
Discontinuation Intervention: 2 unable to contact. 2 other obligations. Control: 2 unable to contact. No of events	n = NA ; % = NA	n = 4 ; % = 15	n = NA ; % = NA	n = 2 ; % = 7

Discontinuation - Polarity - Lower values are better

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

Cognitivetherapy/psychologicaltherapy->1hourto2hours,<5daysaweekcomparedtousualcareat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(EQ-5D-5L)-MeanSD-Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week-Usual care-t2

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

Cognitivetherapy/psychologicaltherapy->1hourto2hours,<5daysaweekcomparedtousualcareat<6months-continuousoutcomes-Psychologicaldistress-Depression(PHQ-9)-MeanSD-Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week-Usual care-t2

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

Cognitivetherapy/psychologicaltherapy->1hourto2hours,<5daysaweekcomparedtousualcareat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Cognitive therapy/psychological therapy - >1 hour to 2 hours, <5 days a week-Usual care-t2

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

Malagoni, 2016

Bibliographic Reference	Malagoni, A. M.; Cavazza, S.; Ferraresi, G.; Grassi, G.; Felisatti, M.; Lamberti, N.; Basaglia, N.; Manfredini, F.; Effects of a "test in-train out" walking program versus supervised standard rehabilitation in chronic stroke patients: a feasibility and pilot randomized study; European journal of physical & rehabilitation medicine.; 2016; vol. 52 (no. 3); 279-87

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Italy
Study setting	The Department of Rehabilitation in the Hospital-University of Ferrara, Italy.
Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	Chronic hemiparesis from an ischaemic or haemorrhagic lesion at least 6 months earlier; between 20 and 80 years of age; ability to ambulate independently for at least 10 meters on level ground; Functional Ambulation Categories Scale score >3; ability to perform a Timed Up and Go test.
Exclusion criteria	Patients with heart failure; unstable angina; peripheral vascular disease; communication disorders (such as global aphasia); dementia; major depression; presence of ataxia or other balance disorders; conditions precluding participation in the exercise (resting systolic hypertension with blood pressure >180mmHg and/or diastolic >110 mmHg and/or heart rate >100bpm); recent participation (<6 months) in any type of physical training or rehabilitation program; lower limb local

	treatments of targeting hyperactive muscles with botulinum toxin or phenolic injection in the last six months; impaired cognitive functioning (Mini Mental State Examination score <24).
Recruitment / selection of participants	Community dwelling stroke survivors included in a registry or patients hospitalised in the last 12 years at the Department of Rehabilitation of the Hospital - University of Ferrara, Italy.
Intervention(s)	Physiotherapy - </=45 minutes, 6 days a week N=6 The Ti-To program consisting of a hospital-based phase and a structured home-based phase. The hospital-based phase included an initial evaluation and monthly follow up exams during the rehabilitation period (at weeks 3, 6 and 10). The home-based phase included the performance of exercise at home. The intervention was based on 2 10-minute sessions/day (6 days/week) of intermittent walking, consisting of bouts of walking alternated by rest while seated, at a prescribed speed converted into a walking cadence and followed at home using a metronome. The walking sessions were preferably performed indoors at home. The duration of each session remained constant, although the walking intensity and length of each bout of exercise were progressively modified according to the improvements achieved. The program was semi-personalised according to the 2-Minute Walk Test, with the program being aimed to progressively increase in walking intensity at weekly intervals, ranging in the entire period from around -15% to +15% of the patient's initial average walking speed. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, <5 days a week N=6 The standard rehabilitation program was conducted in a group setting for 1 hour, 3 times/week under the supervision of two experienced physiotherapists, in the same context (gym of the Rehabilitation Hospital) for the study duration. Each session

	was composed of 20 minutes of endurance exercises (level walking at a free pace and stairs climbing) and 40 minutes of targeted exercises for balance, muscle strength and flexibility. Concomitant therapy: No additional information.
Number of participants	12
Duration of follow-up	10 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy vs. group-based therapy 'Homework'/self management interventions Environmental factors Hospital care and home care
Additional comments	Intention-to-treat

Study arms

Physiotherapy - </=45 minutes, 6 days a week (N = 6)
The Ti-To program consisting of a hospital-based phase and a structured home-based phase. The hospital-based phase included an initial evaluation and monthly follow up exams during the rehabilitation period (at weeks 3, 6 and 10). The home-based phase included the performance of exercise at home. The intervention was based on 2 10-minute sessions/day (6 days/week) of intermittent walking, consisting of bouts of walking alternated by rest while seated, at a prescribed speed converted into a walking cadence and followed at home using a metronome. The walking sessions were preferably performed indoors at home. The duration of each session remained constant, although the walking intensity and length of each bout of exercise were progressively modified according to the improvements achieved. The program was semi-personalised according to the 2-Minute Walk Test, with the program being aimed to progressively increase in walking intensity at weekly intervals, ranging in the entire period from around -15% to +15% of the patient's initial average walking speed. Concomitant therapy: No additional information.

Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 6)
The standard rehabilitation program was conducted in a group setting for 1 hour, 3 times/week under the supervision of two experienced physiotherapists, in the same context (gym of the Rehabilitation Hospital) for the study duration. Each session was composed of 20 minutes of endurance exercises (level walking at a free pace and stairs climbing) and 40 minutes of targeted exercises for balance, muscle strength and flexibility. Concomitant therapy: No additional information.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - </=45 minutes, 6 days a week (N = 6)**	**Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 6)**
% Female Sample size	n = 2 ; % = 33	n = 1 ; % = 17
Mean age (SD) (years)	62.5 (13.8)	70.7 (9)

Characteristic	Physiotherapy - </=45 minutes, 6 days a week (N = 6)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 6)
Mean (SD)		
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Hypertension Sample size	n = 4 ; % = 67	n = 5 ; % = 83
Diabetes Sample size	n = 0 ; % = 0	n = 1 ; % = 17
Heart diseases Sample size	n = 2 ; % = 33	n = 3
Lung diseases Sample size	n = 1 ; % = 17	n = 1 ; % = 17
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (years) Mean (SD)	6.2 (3.5)	6.8 (4.1)

Characteristic	Physiotherapy - </=45 minutes, 6 days a week (N = 6)	Physiotherapy - >45 minutes to 1 hour, <5 days a week (N = 6)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 10 week (<6 months)

Physiotherapy - </=45 minutes, 6 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - </=45 minutes, 6 days a week, Baseline, N = 6	Physiotherapy - </=45 minutes, 6 days a week, 10 week, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 10 week, N = 6
Person/participant generic health-related quality of life (SF-36 physical functioning subscale) Scale range: 0-100. Final values. Only reports the physical functioning subscale. Mean (SD)	48 (30)	67 (15)	27 (19)	47 (17)

Outcome	Physiotherapy - </=45 minutes, 6 days a week, Baseline, N = 6	Physiotherapy - </=45 minutes, 6 days a week, 10 week, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 10 week, N = 6
Physical function - lower limb (6 minute walk test) (meters) Final values Mean (SD)	259.3 (121.7)	308 (104.3)	200.5 (104.3)	251.2 (127.4)

Person/participant generic health-related quality of life (SF-36 physical functioning subscale) - Polarity - Higher values are better
Physical function - lower limb (6 minute walk test) - Polarity - Higher values are better

Physiotherapy - </=45 minutes, 6 days a week compared to Physiotherapy - >45 minutes to 1 hour, <5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - </=45 minutes, 6 days a week, Baseline, N = 6	Physiotherapy - </=45 minutes, 6 days a week, 10 week, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, Baseline, N = 6	Physiotherapy - >45 minutes to 1 hour, <5 days a week, 10 week, N = 6
Discontinuation Retention rate 100% No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy-</=45minutes,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(SF-36physicalfunctioningsubscale)-MeanSD-Physiotherapy - </=45 minutes, 6 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t10

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

Physiotherapy-</=45minutes,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(6minutewalktest)-MeanSD-Physiotherapy - </=45 minutes, 6 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t10

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

Physiotherapy-</=45minutes,6daysaweekcomparedtoPhysiotherapy->45minutesto1hour,<5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - </=45 minutes, 6 days a week-Physiotherapy - >45 minutes to 1 hour, <5 days a week-t10

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

Martins, 2013

Bibliographic Reference	Martins, I. P.; Leal, G.; Fonseca, I.; Farrajota, L.; Aguiar, M.; Fonseca, J.; Lauterbach, M.; Goncalves, L.; Cary, M. C.; Ferreira, J. J.; Ferro, J. M.; A randomized, rater-blinded, parallel trial of intensive speech therapy in sub-acute post-stroke aphasia: the SP-I-R-IT study; International Journal of Language & Communication Disorders; 2013; vol. 48 (no. 4); 421-31

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Portugal
Study setting	Two medical centres: an academic hospital with a speech and language rehabilitation outpatient unit, acute stroke unit and a rehabilitation centre with inpatient and outpatient departments.

Study dates	No additional information
Sources of funding	No additional information
Inclusion criteria	Age between 40 and 80 years; Native Portuguese speaker; Brain imaging confirming a single left hemisphere infarct of the middle cerebral artery territory; Aphasia quotient (AQ) ranging between 6 and 77, comprising mild/moderate (50-77) and severe (6-49) aphasia; Willingness to participate; Personal or family member written consent.
Exclusion criteria	Time post-stroke onset >3 months at screening; Inability to attend rehabilitation sessions on a daily basis; Clinical evidence of dementia, based on semi-standardized family interviews with questions about functional daily living activities and behaviour; Recurrent of stroke while being scheduled to start therapy; Very severe or mild aphasia (AQ <6 or >77) at the time of randomization; Illiteracy; Severe medical or psychiatric disorder that would not allow attendance to therapy.
Recruitment / selection of participants	People at both institutions either in the acute stroke unit or at the outpatient screening visit for new admissions.
Intervention(s)	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week N=15 Intensive speech and language therapy, 2 hours per day, 5 days per week for 10 weeks. Individual sessions of 1 or 2 hours by a qualified speech and language therapist using the Multimodal Stimulation Approach. Five speech and language therapists with comparable experience participated in the study. All received their training in the Multimodal Stimulation Approach and had joint meetings to ensure they were following the same approach, which is based on stimulation, facilitation and motivation, whereby each linguistic modality is used to stimulate another following a programme of increasing complexity. Stimulation included the following exercises: picture confrontation naming, naming from definition and description; description of pictures using complete sentences, phrase complexion; comprehension of instruction exercises, answer to yes/no and 'wh' questions; detection of syntactic and semantic errors in incorrect phrases; interpretation of proverbs; reading and retelling daily news or texts; writing to dictation. All therapists received the same training material. Nonetheless, rehabilitation and training was individualised to respond to each patient's specific needs. Concomitant therapy: All people were evaluated by staff neurologists or clinicians and received antidepressant medication with sertraline (50mg daily).

Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Greater than 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week N=15 Speech and language therapy - 2 hours per week for 50 weeks. Individual sessions of 1 or 2 hours by a qualified speech and language therapist using the Multimodal Stimulation Approach. Five speech and language therapists with comparable experience participated in the study. All received their training in the Multimodal Stimulation Approach and had joint meetings to ensure they were following the same approach, which is based on stimulation, facilitation and motivation, whereby each linguistic modality is used to stimulate another following a programme of increasing complexity. Stimulation included the following exercises: picture confrontation naming, naming from definition and description; description of pictures using complete sentences, phrase complexion; comprehension of instruction exercises, answer to yes/no and 'wh' questions; detection of syntactic and semantic errors in incorrect phrases; interpretation of proverbs; reading and retelling daily news or texts; writing to dictation. All therapists received the same training material. Nonetheless, rehabilitation and training was individualised to respond to each patient's specific needs. Concomitant therapy: All people were evaluated by staff neurologists or clinicians and received antidepressant medication with sertraline (50mg daily).
Number of participants	30
Duration of follow-up	50 weeks, 62 weeks (>6 months)
Indirectness	No additional information

Elements of the study relating to qualitative themes	People with communication difficulties Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	Intention to treat and per protocol analyses, intention to treat will be used

Study arms

Speech and Language Therapy - >1 hour to 2 hours, 5 days a week (N = 15)
Intensive speech and language therapy, 2 hours per day, 5 days per week for 10 weeks. Individual sessions of 1 or 2 hours by a qualified speech and language therapist using the Multimodal Stimulation Approach. Five speech and language therapists with comparable experience participated in the study. All received their training in the Multimodal Stimulation Approach and had joint meetings to ensure they were following the same approach, which is based on stimulation, facilitation and motivation, whereby each linguistic modality is used to stimulate another following a programme of increasing complexity. Stimulation included the following exercises: picture confrontation naming, naming from definition and description; description of pictures using complete sentences, phrase complexion; comprehension of instruction exercises, answer to yes/no and 'wh' questions; detection of syntactic and semantic errors in incorrect phrases; interpretation of proverbs; reading and retelling daily news or texts; writing to dictation. All therapists received the same training material. Nonetheless, rehabilitation and training was individualised to respond to each patient's specific needs. Concomitant therapy: All people were evaluated by staff neurologists or clinicians and received antidepressant medication with sertraline (50mg daily).

Speech and Language Therapy - >1 hour to 2 hours, <5 days a week (N = 15)
Speech and language therapy - 2 hours per week for 50 weeks. Individual sessions of 1 or 2 hours by a qualified speech and language therapist using the Multimodal Stimulation Approach. Five speech and language therapists with comparable experience participated in the study. All received their training in the Multimodal Stimulation Approach and had joint meetings to ensure they were following the same approach, which is based on stimulation, facilitation and motivation, whereby each linguistic modality is used to stimulate another following a programme of increasing complexity. Stimulation included the following exercises: picture confrontation naming, naming from definition and description; description of pictures using complete sentences, phrase complexion; comprehension of instruction exercises, answer to yes/no and 'wh' questions; detection of syntactic and semantic errors in incorrect phrases; interpretation of proverbs; reading and retelling daily news or texts; writing to dictation. All therapists received the same training material. Nonetheless, rehabilitation and training was individualised to respond to each patient's specific needs. Concomitant therapy: All people were evaluated by staff neurologists or clinicians and received antidepressant medication with sertraline (50mg daily).

Characteristics

Arm-level characteristics

Characteristic	**Speech and Language Therapy - >1 hour to 2 hours, 5 days a week (N = 15)**	**Speech and Language Therapy - >1 hour to 2 hours, <5 days a week (N = 15)**
% Female Sample size	n = 5 ; % = 33	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	58.27 (12.29)	64.33 (10.46)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week (N = 15)	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week (N = 15)
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Weeks) Mean (SD)	7.67 (2.97)	7.47 (3.6)
Type of communication difficulty All had aphasia Sample size	n = 15 ; % = NR	n = 15 ; % = 100

Outcomes

Study timepoints

- Baseline
- 10 week (<6 months, discontinuation only)
- 62 week (>6 months)

Speech and Language Therapy - >1 hour to 2 hours, 5 days a week compared to Speech and Language Therapy - >1 hour to 2 hours, <5 days a week - continuous outcomes

Outcome	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 15	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, 10 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, 62 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, 10 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, 62 week, N = 15
Communication - overall language ability (Western Aphasia Battery - Aphasia Quotient) Scale range: 0-100. Change scores. Mean (SD)	37.81 (25.87)	NR (NR)	26.95 (21.09)	41.72 (23.95)	NR (NR)	21.62 (15.99)
Communication - functional communication (Functional Communication Profile) Scale range: Unclear, possibly 0-100. Change scores. Mean (SD)	32.19 (16.67)	NR (NR)	28.03 (15.03)	30.73 (21.52)	NR (NR)	22.9 (8.48)

Communication - overall language ability (Western Aphasia Battery - Aphasia Quotient) - Polarity - Higher values are better
Communication - functional communication (Functional Communication Profile) - Polarity - Higher values are better

Speech and Language Therapy - >1 hour to 2 hours, 5 days a week compared to Speech and Language Therapy - >1 hour to 2 hours, <5 days a week - dichotomous outcome

Outcome	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 15	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, 10 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, 5 days a week, 62 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, Baseline, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, 10 week, N = 15	Speech and Language Therapy - >1 hour to 2 hours, <5 days a week, 62 week, N = 15
Discontinuation 10 weeks: Intervention - 2 discontinued (1 missed evaluation, 1 transferred to another centre). Control - 3 discontinued (1 death, 2 cases of severe illness). 62 weeks: 9 discontinued (4 missed evaluation, 1 death, 1 transferred to another centre, 3 discontinued with no additional information). Control: 7 discontinued (1 death, 2 severe illness, 2 transferred to local centre, 1 severe depression, 1 missed evaluation) No of events	n = NA ; % = NA	n = 2 ; % = 13	n = 9 ; % = 60	n = NA ; % = NA	n = 3 ; % = 20	n = 7 ; % = 47

Discontinuation - Polarity - Lower values are better

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

SpeechandLanguageTherapy->1hourto2hours,5daysaweekcomparedtoSpeechandLanguageTherapy->1hourto2hours,<5daysaweek-continuousoutcomes-Communication-overallIlanguageability(WesternAphasiaBattery-AphasiaQuotient)-MeanSD-Speech and Language Therapy - >1 hour to 2 hours, 5 days a week-Speech and Language Therapy - >1 hour to 2 hours, <5 days a week-t62

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

SpeechandLanguageTherapy->1hourto2hours,5daysaweekcomparedtoSpeechandLanguageTherapy->1hourto2hours,<5daysaweek-continuousoutcomes-Communication-functionalcommunication(FunctionalCommunicationProfile)-MeanSD-Speech and Language Therapy - >1 hour to 2 hours, 5 days a week-Speech and Language Therapy - >1 hour to 2 hours, <5 days a week-t62

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

SpeechandLanguageTherapy->1hourto2hours,5daysaweekcomparedtoSpeechandLanguageTherapy->1hourto2hours,<5daysaweek-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language Therapy - >1 hour to 2 hours, 5 days a week-Speech and Language Therapy - >1 hour to 2 hours, <5 days a week-t10

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

SpeechandLanguageTherapy->1hourto2hours,5daysaweekcomparedtoSpeechandLanguageTherapy->1hourto2hours,<5daysaweek-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language Therapy - >1 hour to 2 hours, 5 days a week-Speech and Language Therapy - >1 hour to 2 hours, <5 days a week-t62

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

Masiero, 2007

Bibliographic Reference	Masiero, S.; Celia, A.; Rosati, G.; Armani, M.; Robotic-assisted rehabilitation of the upper limb after acute stroke; Archives of Physical Medicine & Rehabilitation; 2007; vol. 88 (no. 2); 142-9

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Italy
Study setting	Inpatient at the Stroke Unit of Padova Hospital
Study dates	No additional information
Sources of funding	Supported by the Italian University Ministry (grant no. grant RBAU019C3C_001).
Inclusion criteria	People after first, single, unilateral, ischaemic stroke
Exclusion criteria	Neurologic or cardiovascular instability contraindicating exercise (eg, uncontrolled hypertension); early severe spasticity; multiple cerebrovascular lesions; severe neuropsychologic impairment (global aphasia, severe attention deficit or neglect), because the patient needed to be able to follow instructions
Recruitment / selection of participants	People consecutively admitted to the Stroke Unit of Padova Hospital
Intervention(s)	Occupational therapy - >45 minutes to 1 hour, 5 days a week N=17 Additional early sensorimotor robotic training, 4 hours a week for 5 weeks using the NeReBot device. This is a 3-degree-of-freedom wire-based robot, designed for the treatment of poststroke upper-limb impairment. The device is programmed to perform repetitive movements (flexions and extension, adduction and abduction, pronation and supination, circular) of the upper limb (shoulder and elbow), by stimulating a hand-over-hand therapy with imperceptible differences in the patient's sensorimotor experience. Each exercise is recorded by manually moving the patient's forearm along a set of way points chosen by the therapist, as though the patient was being taught. During treatment, the device provides both visual and auditory feedback to the patient. The sound is increased to signal the start and the end phase of the exercise, but it is not correlated with how the patient is performing. Visual feedback consists of a 3-dimensional image of a virtual upper limb, on

	which 3 arrows show the patient the forces currently applied to the limb by the wires (and hence the desired direction of motion). In this way, the patient is guided through correct execution of the exercise programmed by the physiotherapist at the start of the treatment session. The acoustic and visual feedback is also very useful in maintaining a high level of patient attention throughout the session, simulating a sort of videogame experience. Concomitant therapy: All people received the same dose and length per day of standard rehabilitation treatment (based on the Bobath concept) and poststroke occupational therapy by the same interdisciplinary clinical team (amount of therapy not provided).
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Acute (72 hours - 7 days)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Occupational therapy - </=45 minutes, <5 days a week N=18 Exposed to the robotic device 30 minutes a week, twice a week but the exercises were performed with the unimpaired limb. Concomitant therapy: All people received the same dose and length per day of standard rehabilitation treatment (based on the Bobath concept) and poststroke occupational therapy by the same interdisciplinary clinical team (amount of therapy not provided).
Number of participants	35

Duration of follow-up	5 weeks (end of intervention), 3 months, 8 months.
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Physical environment - requires a lot of space for the robot Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information on method of analysis

Study arms

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 17)
Additional early sensorimotor robotic training, 4 hours a week for 5 weeks using the NeReBot device. This is a 3-degree-of-freedom wire-based robot, designed for the treatment of poststroke upper-limb impairment. The device is programmed to perform repetitive

movements (flexions and extension, adduction and abduction, pronation and supination, circular) of the upper limb (shoulder and elbow), by stimulating a hand-over-hand therapy with imperceptible differences in the patient's sensorimotor experience. Each exercise is recorded by manually moving the patient's forearm along a set of way points chosen by the therapist, as though the patient was being taught. During treatment, the device provides both visual and auditory feedback to the patient. The sound is increased to signal the start and the end phase of the exercise, but it is not correlated with how the patient is performing. Visual feedback consists of a 3-dimensional image of a virtual upper limb, on which 3 arrows show the patient the forces currently applied to the limb by the wires (and hence the desired direction of motion). In this way, the patient is guided through correct execution of the exercise programmed by the physiotherapist at the start of the treatment session. The acoustic and visual feedback is also very useful in maintaining a high level of patient attention throughout the session, simulating a sort of videogame experience. Concomitant therapy: All people received the same dose and length per day of standard rehabilitation treatment (based on the Bobath concept) and poststroke occupational therapy by the same interdisciplinary clinical team (amount of therapy not provided).

Occupational therapy - </=45 minutes, <5 days a week (N = 18)
Exposed to the robotic device 30 minutes a week, twice a week but the exercises were performed with the unimpaired limb. Concomitant therapy: All people received the same dose and length per day of standard rehabilitation treatment (based on the Bobath concept) and poststroke occupational therapy by the same interdisciplinary clinical team (amount of therapy not provided).

Characteristics

Arm-level characteristics

Characteristic	**Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 17)**	**Occupational therapy - </=45 minutes, <5 days a week (N = 18)**
% Female Sample size	n = 7 ; % = 41	n = 7 ; % = 39
Mean age (SD) (years) Mean (SD)	63.4 (11.8)	68.8 (10.5)

Characteristic	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 17)	Occupational therapy - </=45 minutes, <5 days a week (N = 18)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Mean (SD)	NR (NR)	NR (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 3 month (<6 months)
- 8 month (>6 months)

Occupational therapy - >45 minutes to 1 hour, 5 days a week compared to Occupational therapy - </=45 minutes, <5 days a week at <6 months - continuous outcomes

Outcome	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 3 month, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 8 month, N = 17	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 3 month, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 8 month, N = 18
Physical function - upper limb (Fugl Meyer Assessment) Scale range: 0-66. Split into shoulder/elbow and wrist/hand sections. Final values. Mean (SD)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)
Physical function - upper limb (Fugl Meyer Assessment) Scale range: 0-66. Split into shoulder/elbow and wrist/hand sections. Final values. Median (IQR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)	NR (NR to NR)
Shoulder/elbow and coordination subsections Scale range: 0-42	NR (NR)	18.8 (6.4)	20 (7.8)	NR (NR)	8.9 (8.3)	10.5 (13.1)

Outcome	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 3 month, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 8 month, N = 17	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 3 month, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 8 month, N = 18
Mean (SD)						
Shoulder/elbow and coordination subsections Scale range: 0-42 Median (IQR)	8 (4.7 to 15)	NA (NA to NA)	NA (NA to NA)	6 (4 to 20.5)	NA (NA to NA)	NA (NA to NA)
Wrist/hand subsections Scale range: 0-24 Mean (SD)	NR (NR)	5.8 (3.1)	6 (3.2)	NR (NR)	6.1 (3.1)	5.8 (3.8)
Wrist/hand subsections Scale range: 0-24 Median (IQR)	NR (0 to 4.2)	NA (NA to NA)	NA (NA to NA)	NR (0 to 3.5)	NA (NA to NA)	NA (NA to NA)
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	NR (NR)	44.2 (12.1)	46.2 (10.4)	NR (NR)	29.7 (14.5)	31.8 (14.6)

Outcome	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 3 month, N = 17	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 8 month, N = 17	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 3 month, N = 18	Occupational therapy - </=45 minutes, <5 days a week, 8 month, N = 18
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Median (IQR)	57 (52 to 78.2)	NA (NA to NA)	NA (NA to NA)	53 (48 to 73)	NA (NA to NA)	NA (NA to NA)

Physical function - upper limb (Fugl Meyer Assessment) - Polarity - Higher values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-Shoulder/elbowandcoordinationsubsections-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t3

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-Shoulder/elbowandcoordinationsubsections-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t8

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-Wrist/handsubsections-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t3

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerAssessment)-Wrist/handsubsections-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t8

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t3

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

Occupational therapy->45minutesto1hour,5daysaweekcomparedtoOccupational therapy-</=45minutes,<5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, <5 days a week-t8

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

Min, 2020

Bibliographic Reference	Min, J. H.; Seong, H. Y.; Ko, S. H.; Jo, W. R.; Sohn, H. J.; Ahn, Y. H.; Son, J. H.; Seo, H. Y.; Son, Y. R.; Mun, S. J.; Ko, M. H.; Shin, Y. I.; Effects of trunk stabilization training robot on postural control and gait in patients with chronic stroke: a randomized controlled trial; International Journal of Rehabilitation Research; 2020; vol. 43 (no. 2); 159-166

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	KCT0002104
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Two national university hospitals in Korea at outpatient clinics
Study dates	March 2017 to December 2017
Sources of funding	This research was supported by a grant of the Korea Health Technology R&D Project through the Korea Health Industry Development Institute, funded by the Ministry of Health and Welfare, Republic of Korea (grant number: HI15C1529).
Inclusion criteria	Patients who had experienced their first stroke at least 3 months ago; patients who experienced the first episode of unilateral stroke (infarction, haemorrhage) including hemiplegia; patients with the ability to stand and walk with assistance (Berg Balance Scale 21-40).
Exclusion criteria	Severe visual (i.e., visual neglect determined by the Motor-Free Visual Perception Test) and cognitive impairments (Mini-Mental State Examination score <24); musculoskeletal disorders that could potentially interfere with the experimental tests.

Recruitment / selection of participants	People who visited the outpatient clinic.
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=19 30 minutes of trunk stability robot training in addition to conventional physical therapy. Using the Trunk Stability Rehabilitation Robot Trainer (3DBT-33). Stabilisation training is possible through the game using the weight sensor attached to the chair and the left and right buttons in the sitting position. It is possible to use the weight sensor of the footrest to move the center of gravity and to perform leg strength training. These buttons or weight sensors can act as a cursor or command within the training program. The training program using the robot consisted of the following games: standing postural control training with a balloon popping game where body weight is applied in a standing position on a sensor placed on the ground and when the target number for left/right weight is reached, a bee flies to the balloon and pops it, which increases the score; sitting postural control training with a fruit catching game where applying weight to the sensor with the hip and legs while sitting in a chair causes the hand cursor, appearing on the screen to move in all directions to grab the fruit; and sit-to-stand training with a basketball game where the robotic arm comes down while the weight of the left/right hip is maintained in the sitting position, and when the patient applies a force greater than the weight on the footplate by attempting to stand while holding the robotic arm, the robotic tilting chair is activated and the robot arm pulls the patient, and as this motion is repeatedly practiced, applying weight above a certain level on the footplate while maintaining this state for at least 3s results in a basketball going through a rim. The robot group received 30 minutes of trunk stability robot training in addition to conventional physical therapy. The training program with a trunk stability robot consisted of three games for 30 minutes (10 minutes balloon popping, 10 minutes fruit catching, 10 minutes basketball). Concomitant therapy: Conventional physical therapy for 30 minutes a day, 5 days a week for 4 weeks. The conventional physical therapy facilitated symmetrical static and dynamic standing balance function during walking in hemiplegic patients with stroke, as part of a regular neurorehabilitation regimen.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=19 Conventional physical therapy only. Concomitant therapy: Conventional physical therapy for 30 minutes a day, 5 days a week for 4 weeks. The conventional physical therapy facilitated symmetrical static and dynamic standing balance function during walking in hemiplegic patients with stroke, as part of a regular neurorehabilitation regimen.
Number of participants	38
Duration of follow-up	4 weeks (end of intervention), 8 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention themes Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice Need for technical support and training

	Physical environment - bulky robot Environmental factors Hospital care - Outpatient basis Use of expensive equipment
Additional comments	ITT no people discontinued

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 19)
30 minutes of trunk stability robot training in addition to conventional physical therapy. Using the Trunk Stability Rehabilitation Robot Trainer (3DBT-33). Stabilisation training is possible through the game using the weight sensor attached to the chair and the left and right buttons in the sitting position. It is possible to use the weight sensor of the footrest to move the center of gravity and to perform leg strength training. These buttons or weight sensors can act as a cursor or command within the training program. The training program using the robot consisted of the following games: standing postural control training with a balloon popping game where body weight is applied in a standing position on a sensor placed on the ground and when the target number for left/right weight is reached, a bee flies to the balloon and pops it, which increases the score; sitting postural control training with a fruit catching game where applying weight to the sensor with the hip and legs while sitting in a chair causes the hand cursor, appearing on the screen to move in all directions to grab the fruit; and sit-to-stand training with a basketball game where the robotic arm comes down while the weight of the left/right hip is maintained in the sitting position, and when the patient applies a force greater than the weight on the footplate by attempting to stand while holding the robotic arm, the robotic tilting chair is activated and the robot arm pulls the patient, and as this motion is repeatedly practiced, applying weight above a certain level on the footplate while maintaining this state for at least 3s results in a basketball going through a rim. The robot group received 30 minutes of trunk stability robot training in addition to conventional physical therapy. The training program with a trunk stability robot consisted of three games for 30 minutes (10 minutes balloon popping, 10 minutes fruit catching, 10 minutes basketball). Concomitant therapy: Conventional physical therapy for 30 minutes a day,

5 days a week for 4 weeks. The conventional physical therapy facilitated symmetrical static and dynamic standing balance function during walking in hemiplegic patients with stroke, as part of a regular neurorehabilitation regimen.

Physiotherapy - </=45 minutes, 5 days a week (N = 19)
Conventional physical therapy only. Concomitant therapy: Conventional physical therapy for 30 minutes a day, 5 days a week for 4 weeks. The conventional physical therapy facilitated symmetrical static and dynamic standing balance function during walking in hemiplegic patients with stroke, as part of a regular neurorehabilitation regimen.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 19)**	**Physiotherapy - </=45 minutes, 5 days a week (N = 19)**
% Female Sample size	n = 8 ; % = 42	n = 6 ; % = 32
Mean age (SD) (years) Mean (SD)	61.47 (11.15)	56.36 (9.16)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity	n = NR ; % = NR	n = NR ; % = NR

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 19)	Physiotherapy - </=45 minutes, 5 days a week (N = 19)
Sample size		
Time period since stroke (days) Mean (SD)	921.52 (1762)	788.73 (999.24)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 19	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 8 week, N = 19	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 8 week, N = 19
Activities of daily living (Modified Barthel Index)	61.31 (17.59)	67.94 (16.61)	56.78 (20.59)	59.63 (18.96)

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 19	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 8 week, N = 19	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 8 week, N = 19
Scale range: 0-100. Final values. Mean (SD)				
Physical function - lower limb (Fugl Meyer Assessment - Lower Extremity) Scale range: 0-34. Final values. Mean (SD)	21.47 (4.69)	25.73 (4.36)	18.36 (6.06)	19.42 (5.5)

Activities of daily living (Modified Barthel Index) - Polarity - Higher values are better
Physical function - lower limb (Fugl Meyer Assessment - Lower Extremity) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 19	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 8 week, N = 19	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 19	Physiotherapy - </=45 minutes, 5 days a week, 8 week, N = 19
Discontinuation No discontinuation No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(ModifiedBarthelIndex)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t8

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcomes-Physicalfunction-lowerlimb(FuglMeyerAssessment-LowerExtremity)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t8

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t8

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Mirela Cristina, 2015

Bibliographic Reference	Mirela Cristina, L.; Matei, D.; Ignat, B.; Popescu, C. D.; Mirror therapy enhances upper extremity motor recovery in stroke patients; Acta Neurologica Belgica; 2015; vol. 115 (no. 4); 597-603

Study details

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

Study setting	Inpatient setting
Study dates	No additional information
Sources of funding	The research is not financed.
Inclusion criteria	People with hemiparesis following a first stroke (documented by CT scan), time from stroke (between 1 and 3 months) and without severe attention deficit
Exclusion criteria	Global aphasia; cognitive impairments that might interfere with understanding instructions for testing; concomitant progressive central or peripheral nervous system disorders.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=7 Mirror therapy for 30 minutes every day, five times a week for 6 weeks in addition to conventional therapy. Mirror therapy consisted of mirror seen unaffected upper limb movements. People were seated on a chair, with the mirror positioned between the upper limbs perpendicular to the subject's midline and with the unaffected upper limb facing the reflective surface. Under the supervision of the physiotherapist, the patients observed the reflection of their unaffected limb while performing the following movements with the both arms, the affected one as good as possible: flexion and extension of the shoulder, elbow, wrist and finger, prone supination of the forearm. Concomitant therapy: Comprehensive rehabilitative treatment - five half an hour sessions per week with therapy consisting of neurorehabilitative techniques, electrical stimulation and occupational therapy.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only

Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=8 Conventional therapy only. Concomitant therapy: Comprehensive rehabilitative treatment - five half an hour sessions per week with therapy consisting of neurorehabilitative techniques, electrical stimulation and occupational therapy.
Number of participants	15
Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	ITT no discontinuation

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 7)
Mirror therapy for 30 minutes every day, five times a week for 6 weeks in addition to conventional therapy. Mirror therapy consisted of mirror seen unaffected upper limb movements. People were seated on a chair, with the mirror positioned between the upper limbs perpendicular to the subject's midline and with the unaffected upper limb facing the reflective surface. Under the supervision of the physiotherapist, the patients observed the reflection of their unaffected limb while performing the following movements with the both arms, the affected one as good as possible: flexion and extension of the shoulder, elbow, wrist and finger, prone supination of the forearm. Concomitant therapy: Comprehensive rehabilitative treatment - five half an hour sessions per week with therapy consisting of neurorehabilitative techniques, electrical stimulation and occupational therapy.

Physiotherapy - </=45 minutes, 5 days a week (N = 8)
Conventional therapy only. Concomitant therapy: Comprehensive rehabilitative treatment - five half an hour sessions per week with therapy consisting of neurorehabilitative techniques, electrical stimulation and occupational therapy.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 7)**	**Physiotherapy - </=45 minutes, 5 days a week (N = 8)**
% Female Sample size	n = 4 ; % = 57	n = 4 ; % = 50
Mean age (SD) (years) Mean (SD)	58.2 (7.2)	56.8 (8.3)

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 7)	Physiotherapy - </=45 minutes, 5 days a week (N = 8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	54.3 (7.9)	52.2 (12.7)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 7	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 7	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 8	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 8
Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) Scale range: 0-66. Final values. Mean (SD)	34.1 (8.4)	46.5 (7.5)	38.6 (6.2)	47.3 (6.3)

Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 7	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 7	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 8	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 8
Discontinuation No discontinuations No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperExtremity)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Moon, 2017

Bibliographic Reference	Moon, J. H.; Jung, J. H.; Won, Y. S.; Cho, H. Y.; Cho, K.; Effects of expiratory muscle strength training on swallowing function in acute stroke patients with dysphagia; Journal of Physical Therapy Science; 2017; vol. 29 (no. 4); 609-612

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	The I Hospital in Korea
Study dates	2014-2015
Sources of funding	No additional information
Inclusion criteria	Onset of no more than 1 month; the person with swallowing disorder of pharyngeal stage through videofluoroscopic study (VFSS), such as aspiration, invasion or residued of pharyngeal stage; no oral stage problems, such as mastication and oral facial muscle movement; MMSE of more than 24; no specific medical problems, including respirational problems.
Exclusion criteria	Person without the appropriate lips closed; significant facial paralysis; tracheostomy and percutaneous endoscopic gastrostomy; hypertension.

Recruitment / selection of participants	People with dysphagia performed at I Hospital in Korea from 2014-2015
Intervention(s)	Occupational therapy - >45 minutes to 1 hour, 5 days a week N=9 Expiratory Muscle training using the EMST 150. First, people were provided with a mouthpiece to blow into, after which the nasal cavity was closed using forceps. The personal maximal expiratory pressure was then measured using a manometer. They were trained with a threshold value of 70% based on maximal expiratory pressure. The training consisted of taking a deep breath and biting a mouthpiece, during which time the patients was told to blow faster and stronger. Each person received seven trainings per session (lasting 30 minutes), 5 times a week for 4 weeks. Breaks of 30 seconds were provided after one session. Concomitant therapy: Traditional swallowing rehabilitation therapy in 30 minute sessions, five times a week for four weeks. Traditional swallowing treatment was composed of orofacial exercises, thermal-tactile stimulation, the Mendelson manoeuvre, effortful swallow and supraglottic manoeuvre. All swallowing treatments were carried out by the responsible therapists.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Swallow
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - </=45 minutes, 5 days a week N=9 Traditional swallowing rehabilitation therapy only.

	Concomitant therapy: Traditional swallowing rehabilitation therapy in 30 minute sessions, five times a week for four weeks. Traditional swallowing treatment was composed of orofacial exercises, thermal-tactile stimulation, the Mendelson manoeuvre, effortful swallow and supraglottic manoeuvre. All swallowing treatments were carried out by the responsible therapists.
Number of participants	18
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Environmental factors: Hospital care
Additional comments	Not explicitly stated. Likely ITT no discontinuations.

Study arms

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 9)
Expiratory Muscle training using the EMST 150. First, people were provided with a mouthpiece to blow into, after which the nasal cavity was closed using forceps. The personal maximal expiratory pressure was then measured using a manometer. They were trained with a threshold value of 70% based on maximal expiratory pressure. The training consisted of taking a deep breath and biting a mouthpiece, during which time the patients was told to blow faster and stronger. Each person received seven trainings per session (lasting 30 minutes), 5 times a week for 4 weeks. Breaks of 30 seconds were provided after one session. Concomitant therapy: Traditional swallowing rehabilitation therapy in 30 minute sessions, five times a week for four weeks. Traditional swallowing treatment was composed of orofacial exercises, thermal-tactile stimulation, the Mendelson manoeuvre, effortful swallow and supraglottic manoeuvre. All swallowing treatments were carried out by the responsible therapists.

Occupational therapy - </=45 minutes, 5 days a week (N = 9)
Traditional swallowing rehabilitation therapy only. Concomitant therapy: Traditional swallowing rehabilitation therapy in 30 minute sessions, five times a week for four weeks. Traditional swallowing treatment was composed of orofacial exercises, thermal-tactile stimulation, the Mendelson manoeuvre, effortful swallow and supraglottic manoeuvre. All swallowing treatments were carried out by the responsible therapists.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 9)	Occupational therapy - </=45 minutes, 5 days a week (N = 9)
% Female Sample size	n = 3 ; % = 33	n = 3 ; % = 33
Mean age (SD) (years) Mean (SD)	63 (5.8)	63.1 (5.2)

Characteristic	Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 9)	Occupational therapy - </=45 minutes, 5 days a week (N = 9)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	21.4 (5.1)	21.1 (4)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Occupational therapy - >45 minutes to 1 hour, 5 days a week compared to Occupational therapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 9	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 9	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 9	Occupational therapy - </=45 minutes, 5 days a week, 4 week, N = 9
Swallow function and ability (Penetration Aspiration Scale) Scale range: 1-8. Change scores. Mean (SD)	4.78 (1.56)	-2.67 (0.87)	5 (1.32)	-1.11 (1.05)

Swallow function and ability (Penetration Aspiration Scale) - Polarity - Lower values are better

Occupational therapy - >45 minutes to 1 hour, 5 days a week compared to Occupational therapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 9	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 9	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 9	Occupational therapy - </=45 minutes, 5 days a week, 4 week, N = 9
Discontinuation No discontinuations No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Occupationaltherapy->45minutesto1hour,5daysaweekcomparedtoOccupationaltherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Swallowfunctionandability(PenetrationAspirationScale)-MeanSD-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, 5 days a week-t4

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

Occupationaltherapy->45minutesto1hour,5daysaweekcomparedtoOccupationaltherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, 5 days a week-t4

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

Mudie, 2002

Bibliographic Reference	Mudie, M. H.; Winzeler-Mercay, U.; Radwan, S.; Lee, L.; Training symmetry of weight distribution after stroke: a randomized controlled pilot study comparing task-related reach, Bobath and feedback training approaches; Clinical Rehabilitation; 2002; vol. 16 (no. 6); 582-92

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	The Kingston Centre for rehabilitation
Study dates	No additional information
Sources of funding	The project was funded by a La Trobe University Health Services Faculty Grant No.A33.
Inclusion criteria	People who had suffered a recent stroke; bore a majority of their weight consistently to one side in sitting; cognitive screening scores indicating a capacity for re-learning.
Exclusion criteria	Pain; existing co-morbidities that could compromise the response to training; experience of previous balance retraining.

Recruitment / selection of participants	People admitted to the Kingston Centre for rehabilitation
Intervention(s)	Occupational therapy - </=45 minutes, 5 days a week N=30 Three groups: 1) portable computer-linked Balance Performance Monitor feedback console was used to provide awareness of weight distribution during training in sitting. Visual information was provided on weight distribution. Training was completed by people displacing weight to either side whilst reaching to touch a target with the nonparetic hand at various heights and distances. 2) Task-related reach training, where the person was seated on an adjustable plinth with feet flat on the floor. Fifteen grocery items were placed either behind or to the side of the subject or on the floor at approximately 140% of arm's length. These items were retrieved by the nonparetic upper limb and placed on the cupboard shelves at various heights and distances. 3) Training based on Bobath practices. Protocol focussing on increasing trunk and pelvic range of movement, normalising trunk muscle tone, maintaining appropriate balance responses during reaching and improving the subject's ability to move in and out of an asymmetric postural set. A series of postures and postural manoeuvres involving lateral weight shift, lateral, anterior and posterior pelvic tilting and isolated trunk movements were verbally and manually facilitated by the therapist during seated reaching or lying. All training was provided for 30 minutes (appears to be five days a week) for 2 weeks. Concomitant therapy: All people had standard physiotherapy and occupational therapy programmes.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Usual care N=10 No additional training

	Concomitant therapy: All people had standard physiotherapy and occupational therapy programmes.
Number of participants	40
Duration of follow-up	2 weeks (end of intervention), 4 weeks, 16 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care Use of expensive equipment
Additional comments	Method of analysis unclear (does not appear to be intention to treat)

Study arms

Occupational therapy - </=45 minutes, 5 days a week (N = 30)
Three groups: 1) portable computer-linked Balance Performance Monitor feedback console was used to provide awareness of weight distribution during training in sitting. Visual information was provided on weight distribution. Training was completed by people displacing weight to either side whilst reaching to touch a target with the nonparetic hand at various heights and distances. 2) Task-related reach training, where the person was seated on an adjustable plinth with feet flat on the floor. Fifteen grocery items were placed either behind or to the side of the subject or on the floor at approximately 140% of arm's length. These items were retrieved by the nonparetic upper limb and placed on the cupboard shelves at various heights and distances. 3) Training based on Bobath practices. Protocol focussing on increasing trunk and pelvic range of movement, normalising trunk muscle tone, maintaining appropriate balance responses during reaching and improving the subject's ability to move in and out of an asymmetric postural set. A series of postures and postural manoeuvres involving lateral weight shift, lateral, anterior and posterior pelvic tilting and isolated trunk movements were verbally and manually facilitated by the therapist during seated reaching or lying. All training was provided for 30 minutes (appears to be five days a week) for 2 weeks. Concomitant therapy: All people had standard physiotherapy and occupational therapy programmes.

Usual care (N = 10)
No additional training Concomitant therapy: All people had standard physiotherapy and occupational therapy programmes.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 40)**
% Female Sample size	n = 19 ; % = 48
Mean age (SD) Mean (SD)	72.4 (9.01)

Characteristic	Study (N = 40)
Time period since stroke (Weeks) Range	2 to 6

Arm-level characteristics

Characteristic	Occupational therapy - </=45 minutes, 5 days a week (N = 30)	Usual care (N = 10)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 16 week (<6 months)

Occupational therapy - </=45 minutes, 5 days a week compared to Usual care at <6 months - dichotomous outcome

Outcome	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 30	Occupational therapy - </=45 minutes, 5 days a week, 16 week, N = 30	Usual care, Baseline, N = 10	Usual care, 16 week, N = 10
Discontinuation Intervention: 3 refused follow up, 1 had another stroke, 1 unwell from hypotension, 1 went OS, 1 another stroke, 2 admitted to hospital with medical problems. Control: 1 too ill, 3 refused, 1 unable to locate. No of events	n = NA ; % = NA	n = 9 ; % = 30	n = NA ; % = NA	n = 5 ; % = 50

Discontinuation - Polarity - Lower values are better

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

Occupational therapy-</=45minutes,5daysaweekcomparedtoUsualcareat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Occupational therapy - </=45 minutes, 5 days a week-Usual care-t16

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

Mustafaoglu, 2018

Bibliographic Reference	Mustafaoglu, R.; Erhan, B.; Yeldan, I.; Huseyinsinoglu, B. E.; Gunduz, B.; Ozdincler, A. R.; The effects of body weight-supported treadmill training on static and dynamic balance in stroke patients: a pilot, single-blind, randomized trial; Turkish journal of physical medicine and rehabilitation; 2018; vol. 64 (no. 4); 344-352

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	NCT02735148
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	Unclear, likely outpatient
Study dates	November 2014 and November 2015
Sources of funding	The authors received no financial support for the research and/or authorship of this article

Inclusion criteria	Stroke onset at least three months before the study; age range of 18-75 years old; to be able to walk 10m independently or under supervision; to be able to understand all instructions during treatment sessions (Mini Mental State Examination Score at least 24 points).
Exclusion criteria	A previous stroke; musculoskeletal disorders causing contracture or limited range of motion in their lower extremities affecting walking; severe heart disease or medically uncontrolled hypertension.
Recruitment / selection of participants	People assessed for eligibility by two physical medicine and rehabilitation specialists.
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=15 Combination of body weight-supported treadmill training 45 minutes, twice per week and conventional therapy, 45 minutes, 5 times a week. Conventional therapy focused on trunk stabilization, weight transfer to the paretic leg, and walking between parallel bars or on the ground. Treatment activities were designed to improve balance, while encouraging the participant to use their more paretic lower limb. Verbal and tactile cues were used to encourage symmetrical weight distribution. The training was also completed by adding arm activities and reaching activities while walking forward, backward and side to side. The body weight supported treadmill training used a Lokomat system with an integrated treadmill and motor driven body weight support system with real-time feedback control for precise body weight unloading was used for the training. For each participant, the body weight portion was ensured by a security belt while walking. Approximately 30 to 40% of an individual's body weight was supported during the first session and decreased by relative 10% increments per session as tolerated without substantial knee buckling or toe drag. The velocity was adjusted from 1.2-2.6 km/h and was set to the maximum speed tolerated by the patient during sessions. Each session included set up, commands and resting time. Verbal instructions were used for encouragement, but no manual assistance was provided to improve gait pattern. All parameters were individually adjusted for each session, excluding time required for putting on equipment and operation of the computer. Concomitant therapy: No additional information
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=15 Conventional therapy, 45 minutes, 5 times a week. Conventional therapy focused on trunk stabilization, weight transfer to the paretic leg, and walking between parallel bars or on the ground. Treatment activities were designed to improve balance, while encouraging the participant to use their more paretic lower limb. Verbal and tactile cues were used to encourage symmetrical weight distribution. The training was also completed by adding arm activities and reaching activities while walking forward, backward and side to side. Concomitant therapy: No additional information Physiotherapy - </=45 minutes, <5 days a week N=15 Body weight-supported treadmill training 45 minutes, twice per week. The body weight supported treadmill training used a Lokomat system with an integrated treadmill and motor driven body weight support system with real-time feedback control for precise body weight unloading was used for the training. For each participant, the body weight portion was ensured by a security belt while walking. Approximately 30 to 40% of an individual's body weight was supported during the first session and decreased by relative 10% increments per session as tolerated without substantial knee buckling or toe drag. The velocity was adjusted from 1.2-2.6 km/h and was set to the maximum speed tolerated by the patient during sessions. Each session included set up, commands and resting time. Verbal instructions were used for encouragement, but no manual assistance was provided to improve gait pattern. All parameters were individually adjusted for each session, excluding time required for putting on equipment and operation of the computer. Concomitant therapy: No additional information

Number of participants	45
Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	ITT no discontinuations

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)
Combination of body weight-supported treadmill training 45 minutes, twice per week and conventional therapy, 45 minutes, 5 times a week. Conventional therapy focused on trunk stabilization, weight transfer to the paretic leg, and walking between parallel bars or on the ground. Treatment activities were designed to improve balance, while encouraging the participant to use their more paretic lower limb. Verbal and tactile cues were used to encourage symmetrical weight distribution. The training was also completed by adding arm activities and reaching activities while walking forward, backward and side to side. The body weight supported treadmill training used a Lokomat system with an integrated treadmill and motor driven body weight support system with real-time feedback control for precise body weight unloading was used for the training. For each participant, the body weight portion was ensured by a security belt while

walking. Approximately 30 to 40% of an individual's body weight was supported during the first session and decreased by relative 10% increments per session as tolerated without substantial knee buckling or toe drag. The velocity was adjusted from 1.2-2.6 km/h and was set to the maximum speed tolerated by the patient during sessions. Each session included set up, commands and resting time. Verbal instructions were used for encouragement, but no manual assistance was provided to improve gait pattern. All parameters were individually adjusted for each session, excluding time required for putting on equipment and operation of the computer.
Concomitant therapy: No additional information

Physiotherapy - </=45 minutes, 5 days a week (N = 15)
Conventional therapy, 45 minutes, 5 times a week. Conventional therapy focused on trunk stabilization, weight transfer to the paretic leg, and walking between parallel bars or on the ground. Treatment activities were designed to improve balance, while encouraging the participant to use their more paretic lower limb. Verbal and tactile cues were used to encourage symmetrical weight distribution. The training was also completed by adding arm activities and reaching activities while walking forward, backward and side to side.
Concomitant therapy: No additional information

Physiotherapy - </=45 minutes, <5 days a week (N = 15)
Body weight-supported treadmill training 45 minutes, twice per week. The body weight supported treadmill training used a Lokomat system with an integrated treadmill and motor driven body weight support system with real-time feedback control for precise body weight unloading was used for the training. For each participant, the body weight portion was ensured by a security belt while walking. Approximately 30 to 40% of an individual's body weight was supported during the first session and decreased by relative 10% increments per session as tolerated without substantial knee buckling or toe drag. The velocity was adjusted from 1.2-2.6 km/h and was set to the maximum speed tolerated by the patient during sessions. Each session included set up, commands and resting time. Verbal instructions were used for encouragement, but no manual assistance was provided to improve gait pattern. All parameters were individually adjusted for each session, excluding time required for putting on equipment and operation of the computer.
Concomitant therapy: No additional information

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)	Physiotherapy - </=45 minutes, 5 days a week (N = 15)	Physiotherapy - </=45 minutes, <5 days a week (N = 15)
% Female Sample size	n = 5 ; % = 33	n = 4 ; % = 27	n = 4 ; % = 27
Mean age (SD) (years) Mean (SD)	52.8 (13.8)	53.7 (11.6)	52.6 (14.7)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Range	3 to 36	4 to 28	7 to 18
Time period since stroke (Months) Median (IQR)	12.5 (NR to NR)	11 (NR to NR)	12 (NR to NR)

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 15)	Physiotherapy - </=45 minutes, 5 days a week (N = 15)	Physiotherapy - </=45 minutes, <5 days a week (N = 15)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week and Physiotherapy - </=45 minutes, <5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 6 week, N = 15
Physical function - lower limb (Berg Balance Scale) Scale range:	33.6 (6.6)	47.7 (7.2)	33.1 (3.4)	41.8 (3.7)	34.6 (3.6)	42.9 (2.6)

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 6 week, N = 15
0-56. Final values. Mean (SD)						

Physical function - lower limb (Berg Balance Scale) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week and Physiotherapy - </=45 minutes, <5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 15	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 15	Physiotherapy - </=45 minutes, <5 days a week, Baseline, N = 15	Physiotherapy - </=45 minutes, <5 days a week, 6 week, N = 15
Discontinuation No discontinuations No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekandPhysiotherapy-</=45minutes,<5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(BergBalanceScale)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-Physiotherapy - </=45 minutes, <5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekandPhysiotherapy-</=45minutes,<5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-Physiotherapy - </=45 minutes, <5 days a week-t6

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

Norouzi-Gheidari, 2019

Bibliographic Reference	Norouzi-Gheidari, N.; Hernandez, A.; Archambault, P. S.; Higgins, J.; Poissant, L.; Kairy, D.; Feasibility, Safety and Efficacy of a Virtual Reality Exergame System to Supplement Upper Extremity Rehabilitation Post-Stroke: A Pilot Randomized Clinical Trial and Proof of Principle; International Journal of Environmental Research & Public Health [Electronic Resource]; 2019; vol. 17 (no. 1); 23

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	Canada
Study setting	Outpatient rehabilitation services
Study dates	No additional information
Sources of funding	This study was partially funded by the Lindsay Rehabilitation Hospital Foundation and Jintronix Inc.
Inclusion criteria	Having had an ischaemic or haemorrhagic stroke for the first time; having residual mild to moderate upper extremity impairment (score 3-6 on the Chedoke-McMaster arm component); being in subacute or chronic stage; receiving usual outpatient rehabilitation services at one of the two selected rehabilitation sites, i.e., Institute de readaptation Gingras-Lindsay-de-Montreal and Jewish Rehabilitation Hospital, all located in the greater Montreal area in Canada
Exclusion criteria	Having severe cognitive or communication deficits; having visual impairments; having any medical contraindication for shoulder movements; having severe balance deficits limiting sitting safely independently; having previous upper extremity impairment limiting potential recovery; having any other impairment that limited use of virtual reality system.

Recruitment / selection of participants	People receiving outpatient rehabilitation services but remained with upper extremity motor deficits
Intervention(s)	Occupational therapy - </=45 minutes, <5 days a week N=9 The Jintronix system, a rehabilitation exergaming system. The system is an interactive exergame based on the Kinect camera, a marker-less motion tracking system that does not require wearable sensors. The system provides repeated unilateral and bilateral upper extremity training in all planes, at customisable difficulty levels: speed, target size, precision and predictability. Five upper extremity activities are performed against gravity: tracing a horizontally or vertically oriented path; reaching for a target; moving the hands together to catch, carry and drop objects; clapping both hands to catch an object between the two hands; selecting and moving kitchen objects. All activities were done while sitting. This system was set up at two rehabilitation centers, using a desktop computer and a Kinect camera. Each person received training with the device two to three times per week, 30 minutes per session (excluding preparation and other interactions with the system) for 4 weeks in addition to usual care. Rest between therapy and gaming sessions were ensured. The intensity and choice of the exergame activities were determined by the therapists based on the patient's abilities, interests, motivation and fatigue. Concomitant therapy: Occupational and/or physical therapy services provided two to three times a week.
Intervention stratification - Type of therapist	Occupational therapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Usual care N=9 Conventional therapy only.

	Concomitant therapy: Occupational and/or physical therapy services provided two to three times a week.
Number of participants	18
Duration of follow-up	4 weeks (end of intervention), 8 weeks
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - Therapy adapted dependent on a range of factors (patient's abilities, interests, motivation and fatigue) Person factors Fatigue Motivation Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools

	Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information on method of analysis. Appears to only include people who completed the study in the analysis (does not report about which groups these participants were assigned to).

Study arms

Occupational therapy - </=45 minutes, <5 days a week (N = 9)
The Jintronix system, a rehabilitation exergaming system. The system is an interactive exergame based on the Kinect camera, a marker-less motion tracking system that does not require wearable sensors. The system provides repeated unilateral and bilateral upper extremity training in all planes, at customisable difficulty levels: speed, target size, precision and predictability. Five upper extremity activities are performed against gravity: tracing a horizontally or vertically oriented path; reaching for a target; moving the hands together to catch, carry and drop objects; clapping both hands to catch an object between the two hands; selecting and moving kitchen objects. All activities were done while sitting. This system was set up at two rehabilitation centers, using a desktop computer and a Kinect camera. Each person received training with the device two to three times per week, 30 minutes per session (excluding preparation and other interactions with the system) for 4 weeks in addition to usual care. Rest between therapy and gaming sessions were ensured. The intensity and choice of the exergame activities were determined by the therapists based on the patient's abilities, interests, motivation and fatigue. Concomitant therapy: Occupational and/or physical therapy services provided two to three times a week.

Usual care (N = 9)
Conventional therapy only. Concomitant therapy: Occupational and/or physical therapy services provided two to three times a week.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy - </=45 minutes, <5 days a week (N = 9)	Usual care (N = 9)
% Female Sample size	n = 4 ; % = 44	n = 4 ; % = 44
Mean age (SD) (years) Mean (SD)	42.2 (9.5)	57.6 (10.5)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	5.7 (3.2)	8.4 (7.8)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Occupational therapy - </=45 minutes, <5 days a week compared to usual care at <6 months - continuous outcomes

Outcome	Occupational therapy - </=45 minutes, <5 days a week, Baseline, N = 9	Occupational therapy - </=45 minutes, <5 days a week, 8 week, N = 9	Usual care, Baseline, N = 9	Usual care, 8 week, N = 9
Person/participant generic health-related quality of life (Stroke Impact Scale Total) Scale range: 0-100. Final values. Mean (SD)	68.2 (14.5)	75.8 (14)	71.3 (10.8)	73.5 (14.7)
Physical function - upper limb (Fugl Meyer Upper Extremity) Scale range: 0-66. Final values. Mean (SD)	44.2 (18.8)	47.2 (14.7)	48 (11.4)	47.6 (13.3)

Person/participant generic health-related quality of life (Stroke Impact Scale Total) - Polarity - Higher values are better
Physical function - upper limb (Fugl Meyer Upper Extremity) - Polarity - Higher values are better

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

Occupational therapy-</=45minutes,<5daysaweekcomparedtousualcareat<6months-continuousoutcomes-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScaleTotal)-MeanSD-Occupational therapy - </=45 minutes, <5 days a week-Usual care-t8

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

Occupational therapy-</=45minutes,<5daysaweekcomparedtousualcareat<6months-continuousoutcomes-Physicalfunction-upperlimb(FuglMeyerUpperExtremity)-MeanSD-Occupational therapy - </=45 minutes, <5 days a week-Usual care-t8

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

Øra, 2020

Bibliographic Reference	Øra, H. P.; Kirmess, M.; Brady, M. C.; Partee, I.; Hognestad, R. B.; Johannessen, B. B.; Thommessen, B.; Becker, F.; The effect of augmented speech-language therapy delivered by telerehabilitation on poststroke aphasia-a pilot randomized controlled trial; Clinical rehabilitation; 2020; vol. 34 (no. 3); 369-381

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	Ora, H. P.; Kirmess, M.; Brady, M. C.; Sorli, H.; Becker, F.; Technical Features, Feasibility, and Acceptability of Augmented Telerehabilitation in Post-stroke Aphasia-Experiences From a Randomized Controlled Trial; Frontiers in neurology [electronic resource].; 2020; vol. 11; 671
Trial name / registration number	NCT02768922
Study type	Randomised controlled trial (RCT)
Study location	Norway
Study setting	Telerehabilitation delivered from tertiary rehabilitation center to participants at their home or admitted to secondary rehabilitation centers
Study dates	No additional information
Sources of funding	The trial is funded by the South-Eastern Norway Regional Health Authority (project number 2015037) and has also received financial support from the University of Oslo and Sunnaas Rehabilitation Hospital. The NMAHP RU and MB is supported by the Chief Scientist Office, part of the Scottish Government Health and Social Care Directorates.
Inclusion criteria	People with aphasia following stroke (any time post stroke); aphasia including naming impairment (percentile score of 70 or lower on the Norwegian Basic Aphasia Assessment subtest naming); Norwegian as their main language.
Exclusion criteria	Age below 16 years; patients who were unable to perform five hours of speech-language therapy per week due to medical or cognitive reasons (including moderate to severe hearing or visual impairment); patients who scored >70 percentile score on the Norwegian Basic Aphasia Assessment subtest naming; patients with traumatic brain injury.

Recruitment / selection of participants	People recruited within the Oslo region from stroke units at four different hospitals, from rehabilitation institutions including Sunnaas Rehabilitation Hospital, and from cooperating speech-language pathologists.
Intervention(s)	Speech and Language Therapists - >1 to 2 hours, 5 days a week N=32 Telerehabilitation intervention. The intervention targeted spoken language with tasks including word production, picture naming and discussion about familiar topics. Materials used in the intervention included a Norwegian Translation of the Newcastle University Aphasia Therapy Resources and a computer training program targeting all language modalities called Lexia. They also used "Sareptas afasikrukke", a collection of Norwegian tasks comprising individual aphasia exercises training all modalities (for example: oral and written naming, reading sentences and text). In addition, text, maps and pictures from the Internet were used as resources in therapy sessions. Three speech-language pathologists delivered the telerehabilitation intervention. At least 5 hours a week should be delivered in addition to usual care. The technical setup was given by a speech-language pathologist using videoconferencing through internet from Sunnaas Rehabilitation Hospital to a study laptop in the participant's home or in the rehabilitation ward where the participant was admitted. The videoconference software Cisco Jabber/Acano from the "Norwegian Health Net" was installed in the study laptops given to the participants and in videoconference equipment at Sunnaas Rehabilitation Hospital. The software LogMeIn was used to remotely control the participant's computer. Videoconferencing was provided through encrypted software. The technical setup further included an external speaker to improve sound quality and a wide-angle web camera. Participants were given training to use the computer software usually lasting 30-60 minutes. 18.6 (1.5) hours of videoconferencing, with a total of 39.0 (12.2) hours in total when combined with usual care (totalling >1 hour to 2 hours, 5 days a week). Concomitant therapy: All participants received usual care during the study period provided by local speech language pathologists at the community level and/or in a rehabilitation institution. The dosage was measured in hours from inclusion to follow-up assessment. Hours of usual care: 25 (13.8), delivered approximately as 1 hour sessions, 5 days a week.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Mixed
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mixed
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Speech and Language Therapists

Comparator	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week N=30 Usual care only. Concomitant therapy: All participants received usual care during the study period provided by local speech language pathologists at the community level and/or in a rehabilitation institution. The dosage was measured in hours from inclusion to follow-up assessment. Hours of usual care: 25 (13.8), delivered approximately as 1 hour sessions, 5 days a week.
Number of participants	62
Duration of follow-up	4 weeks (end of intervention), 4 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Need for technical support and training - requires a significant amount of setup time and support to work Environmental factors

	Home Supervision Use of expensive equipment
Additional comments	Intention to treat

Study arms

Speech and Language Therapists - >1 to 2 hours, 5 days a week (N = 32)
Telerehabilitation intervention. The intervention targeted spoken language with tasks including word production, picture naming and discussion about familiar topics. Materials used in the intervention included a Norwegian Translation of the Newcastle University Aphasia Therapy Resources and a computer training program targeting all language modalities called Lexia. They also used "Sareptas afasikrukke", a collection of Norwegian tasks comprising individual aphasia exercises training all modalities (for example: oral and written naming, reading sentences and text). In addition, text, maps and pictures from the Internet were used as resources in therapy sessions. Three speech-language pathologists delivered the telerehabilitation intervention. At least 5 hours a week should be delivered in addition to usual care. The technical setup was given by a speech-language pathologist using videoconferencing through internet from Sunnaas Rehabilitation Hospital to a study laptop in the participant's home or in the rehabilitation ward where the participant was admitted. The videoconference software Cisco Jabber/Acano from the "Norwegian Health Net" was installed in the study laptops given to the participants and in videoconference equipment at Sunnaas Rehabilitation Hospital. The software LogMeIn was used to remotely control the participant's computer. Videoconferencing was provided through encrypted software. The technical setup further included an external speaker to improve sound quality and a wide-angle web camera. Participants were given training to use the computer software usually lasting 30-60 minutes. 18.6 (1.5) hours of videoconferencing, with a total of 39.0 (12.2) hours in total when combined with usual care (totalling >1 hour to 2 hours, 5 days a week). Concomitant therapy: All participants received usual care during the study period provided by local speech language pathologists at the community level and/or in a rehabilitation institution. The dosage was measured in hours from inclusion to follow-up assessment. Hours of usual care: 25 (13.8), delivered approximately as 1 hour sessions, 5 days a week.

Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week (N = 30)
Usual care only. Concomitant therapy: All participants received usual care during the study period provided by local speech language pathologists at the community level and/or in a rehabilitation institution. The dosage was measured in hours from inclusion to follow-up assessment. Hours of usual care: 25 (13.8), delivered approximately as 1 hour sessions, 5 days a week.

Characteristics

Arm-level characteristics

Characteristic	Speech and Language Therapists - >1 to 2 hours, 5 days a week (N = 32)	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week (N = 30)
% Female Sample size	n = 13 ; % = 40.6	n = 8 ; % = 26.7
Mean age (SD) (years) Mean (SD)	64.7 (11.7)	65 (12.2)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Slight disability Sample size	n = 15 ; % = 46.9	n = 14 ; % = 46.7

Characteristic	Speech and Language Therapists - >1 to 2 hours, 5 days a week (N = 32)	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week (N = 30)
Moderate disability Sample size	n = 9 ; % = 28.1	n = 9 ; % = 30
Moderately severe disability Sample size	n = 7 ; % = 21.9	n = 7 ; % = 23.3
Severe disability Sample size	n = 1 ; % = 3.1	n = 0 ; % = 0
Time period since stroke (Months) Sample size	n = NA ; % = NA	n = NA ; % = NA
</=3 months Sample size	n = 16 ; % = 50	n = 12 ; % = 40
3-12 months Sample size	n = 5 ; % = 15.6	n = 4 ; % = 13.3
12 months Sample size	n = 11 ; % = 34.4	n = 14 ; % = 46.7
Type of communication difficulty All had aphasia Sample size	n = 32 ; % = 100	n = 30 ; % = 100

Outcomes

Study timepoints

- Baseline
- 4 month (<6 months)

Speech and Language Therapists - >1 to 2 hours, 5 days a week compared to Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcomes

Outcome	Speech and Language Therapists - >1 to 2 hours, 5 days a week, Baseline, N = 32	Speech and Language Therapists - >1 to 2 hours, 5 days a week, 4 month, N = 32	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, Baseline, N = 30	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, 4 month, N = 30
Communication - Impairment specific measures (Naming) (NGA subtest naming) Scale range: Unclear, likely 0-100. Final values. Mean (SD)	38.9 (13.7)	50.4 (22.4)	45 (17.6)	54.1 (24.9)
Communication - Impairment specific measures (Auditory Comprehension) (NGA subtest comprehension) Scale range: Unclear, likely 0-100. Final values. Mean (SD)	47.6 (19.8)	61 (24)	52.8 (24)	61.5 (29.5)
Communication - Functional communication (Communicative	NR (NR)	61.3 (19)	NR (NR)	61.3 (21.9)

Outcome	Speech and Language Therapists - >1 to 2 hours, 5 days a week, Baseline, N = 32	Speech and Language Therapists - >1 to 2 hours, 5 days a week, 4 month, N = 32	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, Baseline, N = 30	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, 4 month, N = 30
Effectiveness Index) Scale range: Unclear, likely 0-100. Final values. 24 people in intervention arm, 22 people in control arm. Mean (SD)				

Communication - Impairment specific measures (Naming) (NGA subtest naming) - Polarity - Higher values are better
Communication - Impairment specific measures (Auditory Comprehension) (NGA subtest comprehension) - Polarity - Higher values are better
Communication - Functional communication (Communicative Effectiveness Index) - Polarity - Higher values are better

Speech and Language Therapists - >1 to 2 hours, 5 days a week compared to Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Speech and Language Therapists - >1 to 2 hours, 5 days a week, Baseline, N = 32	Speech and Language Therapists - >1 to 2 hours, 5 days a week, 4 month, N = 32	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, Baseline, N = 30	Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week, 4 month, N = 30
Discontinuation Intervention: 1 withdrew, 1 died, 1 unable to attend follow-up due to hospitalisation. Control: 3 withdrew. No of events	n = NA ; % = NA	n = 3	n = NA ; % = NA	n = 3 ; % = 10

Discontinuation - Polarity - Lower values are better

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

SpeechandLanguageTherapists->1to2hours,5daysaweekcomparedtoSpeechandLanguageTherapists->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Communication-Impairmentspecificmeasures(Naming)(NGAsubtestnaming)-MeanSD-Speech and Language Therapists - >1 to 2 hours, 5 days a week-Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week-t4

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

SpeechandLanguageTherapists->1to2hours,5daysaweekcomparedtoSpeechandLanguageTherapists->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Communication-Impairmentspecificmeasures(AuditoryComprehension)(NGAsubtestcomprehension)-MeanSD-Speech and Language Therapists - >1 to 2 hours, 5 days a week-Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week-t4

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

SpeechandLanguageTherapists->1to2hours,5daysaweekcomparedtoSpeechandLanguageTherapists->45minutesto1hour,5daysaweekat<6months-continuousoutcomes-Communication-Functionalcommunication(CommunicativeEffectivenessIndex)-MeanSD-Speech and Language Therapists - >1 to 2 hours, 5 days a week-Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week-t4

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

SpeechandLanguageTherapists->1to2hours,5daysaweekcomparedtoSpeechandLanguageTherapists->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Speech and Language Therapists - >1 to 2 hours, 5 days a week-Speech and Language Therapists - >45 minutes to 1 hour, 5 days a week-t4

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

Ora, 2020

Bibliographic Reference	Ora, H. P.; Kirmess, M.; Brady, M. C.; Sorli, H.; Becker, F.; Technical Features, Feasibility, and Acceptability of Augmented Telerehabilitation in Post-stroke Aphasia-Experiences From a Randomized Controlled Trial; Frontiers in neurology [electronic resource].; 2020; vol. 11; 671

Study details

Secondary publication of another included study- see primary study for details	Øra, H. P.; Kirmess, M.; Brady, M. C.; Partee, I.; Hognestad, R. B.; Johannessen, B. B.; Thommessen, B.; Becker, F.; The effect of augmented speech-language therapy delivered by telerehabilitation on poststroke aphasia-a pilot randomized controlled trial; Clinical rehabilitation; 2020; vol. 34 (no. 3); 369-381
Other publications associated with this study included in review	No additional information

Page, 2012

Bibliographic Reference	Page, S. J.; Levin, L.; Hermann, V.; Dunning, K.; Levine, P.; Longer versus shorter daily durations of electrical stimulation during task-specific practice in moderately impaired stroke; Archives of Physical Medicine & Rehabilitation; 2012; vol. 93 (no. 2); 200-6

Study details

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

this study included in review	
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United States of America
Study setting	Outpatient rehabilitation hospital
Study dates	No additional information
Sources of funding	Supported by an award from the American Heart Association
Inclusion criteria	No active extension in the affected wrist or fingers; stroke experienced more than 6 months prior to study enrolment; a score of 70 or more on the Modified Mini Mental State Examination; aged 18 or older 85 or younger; only experienced 1 stroke; discharged from all physical rehabilitation.; at least partial ability to move outside of synergies at the affected elbow, as indicated by Fugl-Meyer items IV and V.
Exclusion criteria	Participating in any experimental rehabilitation or drug studies; uncontrolled seizure disorders; excessive spasticity at the paretic elbow, wrist, or fingers defined as a score of 3 or higher on the Modified Ashworth Scale; excessive pain in the affected upper extremity, as measured by a score of 4 or higher on a 10-point visual analog scale.
Recruitment / selection of participants	People recruited using advertisements placed in approximately 19 outpatient rehabilitative clinics in the Midwestern United States.
Intervention(s)	Occupational Therapy - >1 hour to 2 hours, 5 days a week N=8 2 hour group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 120 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using

	the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. Concomitant therapy: All people had an education session (the content being relevant to their intervention aims). Occupational therapy - >45 minutes to 1 hour, 5 days a week N=8 1 hour group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 60 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. Concomitant therapy: All people had an education session (the content being relevant to their intervention aims).
Intervention stratification - Type of therapist	Occupational therapy
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy - </=45 minutes, 5 days a week N=16 Two groups: 1) 30 minute group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 30 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. 2) Conventional home exercise program for 30 minutes for 5 days a week over 8 weeks. Not tailored to the individual's requirements.

	Concomitant therapy: All people had an education session (the content being relevant to their intervention aims).
Number of participants	32
Duration of follow-up	8 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy 'Homework'/self management interventions Goal setting Environmental factors Home
Additional comments	No information about method of analysis. 4 people discontinued and they weren't included in the analysis.

Study arms

Occupational Therapy - >1 hour to 2 hours, 5 days a week (N = 8)
2 hour group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 120 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. Concomitant therapy: All people had an education session (the content being relevant to their intervention aims).

Occupational therapy - >45 minutes to 1 hour, 5 days a week (N = 8)
1 hour group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 60 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. Concomitant therapy: All people had an education session (the content being relevant to their intervention aims).

Occupational therapy - </=45 minutes, 5 days a week (N = 16)
Two groups: 1) 30 minute group where they practice valued activities identified from the Canadian Occupational Performance Measure at home for 30 minutes for 5 days a week over an 8 week period. The therapist helped the person to select goals from using the Canadian Occupational Performance Measure and designed the therapy regarding these goals. Exercises were completed while using the H200, an electrical stimulation device. 2) Conventional home exercise program for 30 minutes for 5 days a week over 8 weeks. Not tailored to the individual's requirements. Concomitant therapy: All people had an education session (the content being relevant to their intervention aims).

Characteristics

Study-level characteristics

Characteristic	**Study (N = 32)**
% Female Sample size	n = 17 ; % = 53
Mean age (SD) (years) Mean (SD)	57.6 (10.1)
Ethnicity Sample size	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	53.8 (69.4)
Type of communication difficulty Sample size	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 8 week (<6 months)

Occupational Therapy - >1 hour to 2 hours, 5 days a week compared to Occupational Therapy - >45 minutes to 1 hour, 5 days a week and Occupational Therapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Occupational Therapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 8	Occupational Therapy - >1 hour to 2 hours, 5 days a week, 8 week, N = 8	Occupational therapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 8	Occupational therapy - >45 minutes to 1 hour, 5 days a week, 8 week, N = 8	Occupational therapy - </=45 minutes, 5 days a week, Baseline, N = 16	Occupational therapy - </=45 minutes, 5 days a week, 8 week, N = 16
Physical function - upper limb (Fugl Meyer Total Score) Scale range: 0-66. Change scores. Mean (SD)	27.1 (7.5)	4.1 (2.9)	26.6 (10.4)	1.3 (2.2)	23 (7.4)	1.6 (2.3)

Physical function - upper limb (Fugl Meyer Total Score) - Polarity - Higher values are better

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

OccupationalTherapy->1hourto2hours,5daysaweekcomparedtoOccupationalTherapy->45minutesto1hour,5daysaweekandOccupationalTherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-upperlimb(FuglMeyerTotalScore)-MeanSD-Occupational Therapy - >1 hour to 2 hours, 5 days a week-Occupational therapy - >45 minutes to 1 hour, 5 days a week-Occupational therapy - </=45 minutes, 5 days a week-t8

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

Pálsdóttir, 2020

Bibliographic Reference	Pálsdóttir, A. M.; Stigmar, K.; Norrving, B.; Petersson, I. F.; Åström, M.; Pessah-Rasmussen, H.; The nature stroke study; NASTRU: a randomized controlled trial of nature-based post-stroke fatigue rehabilitation; Journal of rehabilitation medicine; 2020; vol. 52 (no. 2); jrm00020

Study details

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

this study included in review	
Trial name / registration number	NCT02435043
Study type	Randomised controlled trial (RCT)
Study location	Sweden
Study setting	Skane University Hospital at the acute stroke stage
Study dates	February 2013 to August 2014
Sources of funding	The study was funded by Region Skane county council; the Crafoord Research Fund and the Swedish Stroke Association.
Inclusion criteria	People, 50-80 years old; who had been admitted to Skane University Hospital at the acute stroke stage; who were living in Malmo, the third largest city in Sweden or in nearby smaller municipalities; who were independent in personal activities of daily living; reported PSF affecting their daily lives.
Exclusion criteria	Patients with dementia; severe aphasia; not fluent in Swedish; those with severe comorbidities.
Recruitment / selection of participants	People who had been to Skane University Hospital at the acute stroke stage
Intervention(s)	Multidisciplinary team - >2-4 hours, <5 days a week N=51 Nature based rehabilitation program, 10 weeks completed in groups of up to 8 patients, at Alnarp Rehabilitation Garden (countryside, with the longest distance from any patient's home being approximately 25km and the shortest 10km). The 2-hectare garden contains places for work, rest and contemplation and is divided into two major areas: the Nature Area (informal and non-cultivated) and the Cultivation and Gardening Area (formal and cultivated). It is further sub-divided into different garden rooms, each designed with special properties for supporting restorative activities or facilitating meaningful

	horticulture and garden activities. The programme was grounded in horticultural therapy, supported by a multimodal rehabilitation team that utilized the garden/nature for multi-sensory stimulation for physical, emotional and cognitive stimulation. The programme started within 2 weeks after randomisation, with continuous admission and was scheduled for 2 days a week, with each session lasting 3.5 hours. The intervention programme was managed by the occupational therapist and horticulturalist, along with the psychotherapist and physiotherapist, who joined the garden sessions. Each day had the same basic structure, with 4 themed sessions: i) morning gathering with a cup of herbal tea, allowing participants to feel at ease after travelling from their homes, ii) physical activities, such as a garden walk, tricycling or "on the spot" exercises, which were held indoors in the greenhouses when the weather was not favourable; iii) garden and horticultural occupation, in a group or on their own, or "just being" (i.e. mental recovery on their own enjoying the garden); iv) gathering for "closure for the day", with some light refreshments harvested from the garden, fresh or preserved. The last sessions also allowed participants the opportunity to reflect on their own processes in relation to the rehabilitation. Concomitant therapy: Standard care was available. Standard care after stroke in Sweden is highly individualised, depending on patients' needs and characteristics, and even on the local organisation. It can comprise, for example, physiotherapy and/or occupational therapy, and interventions addressing mental health at the primary care level, speech therapy and/or comprehensive outpatient stroke rehabilitation by interdisciplinary team at the specialist level. Not all people with mild strokes have access to rehabilitation.
Intervention stratification - Type of therapist	Multidisciplinary team
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Mild (or NIHSS 1-5)
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Usual care N=50 Standard care. Concomitant therapy: Standard care was available. Standard care after stroke in Sweden is highly individualised, depending on patients' needs and characteristics, and even on the local organisation. It can comprise, for example, physiotherapy and/or occupational therapy, and interventions addressing mental health at the primary care level, speech

	therapy and/or comprehensive outpatient stroke rehabilitation by interdisciplinary team at the specialist level. Not all people with mild strokes have access to rehabilitation.
Number of participants	101
Duration of follow-up	8 and 14 months after randomisation
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Group-based therapy Variety in activities and choice - Horticulture based, but includes self reflection and a variety of other activities.
Additional comments	Intention to treat.

Study arms

Multidisciplinary team - >2-4 hours, <5 days a week (N = 51)
Nature based rehabilitation program, 10 weeks completed in groups of up to 8 patients, at Alnarp Rehabilitation Garden (countryside, with the longest distance from any patient's home being approximately 25km and the shortest 10km). The 2-hectare garden contains places for work, rest and contemplation and is divided into two major areas: the Nature Area (informal and non-cultivated) and the Cultivation and Gardening Area (formal and cultivated). It is further sub-divided into different garden rooms, each designed with special properties for supporting restorative activities or facilitating meaningful horticulture and garden activities. The programme was grounded in horticultural therapy, supported by a multimodal rehabilitation team that utilized the garden/nature for multi-sensory stimulation for physical, emotional and cognitive stimulation. The programme started within 2 weeks after randomisation, with

continuous admission and was scheduled for 2 days a week, with each session lasting 3.5 hours. The intervention programme was managed by the occupational therapist and horticulturalist, along with the psychotherapist and physiotherapist, who joined the garden sessions. Each day had the same basic structure, with 4 themed sessions: i) morning gathering with a cup of herbal tea, allowing participants to feel at ease after travelling from their homes, ii) physical activities, such as a garden walk, tricycling or "on the spot" exercises, which were held indoors in the greenhouses when the weather was not favourable; iii) garden and horticultural occupation, in a group or on their own, or "just being" (i.e. mental recovery on their own enjoying the garden); iv) gathering for "closure for the day", with some light refreshments harvested from the garden, fresh or preserved. The last sessions also allowed participants the opportunity to reflect on their own processes in relation to the rehabilitation. Concomitant therapy: Standard care was available. Standard care after stroke in Sweden is highly individualised, depending on patients' needs and characteristics, and even on the local organisation. It can comprise, for example, physiotherapy and/or occupational therapy, and interventions addressing mental health at the primary care level, speech therapy and/or comprehensive outpatient stroke rehabilitation by interdisciplinary team at the specialist level. Not all people with mild strokes have access to rehabilitation.

Usual care (N = 50)
Standard care. Concomitant therapy: Standard care was available. Standard care after stroke in Sweden is highly individualised, depending on patients' needs and characteristics, and even on the local organisation. It can comprise, for example, physiotherapy and/or occupational therapy, and interventions addressing mental health at the primary care level, speech therapy and/or comprehensive outpatient stroke rehabilitation by interdisciplinary team at the specialist level. Not all people with mild strokes have access to rehabilitation.

Characteristics

Arm-level characteristics

Characteristic	**Multidisciplinary team - >2-4 hours, <5 days a week (N = 51)**	**Usual care (N = 50)**
% Female Sample size	n = 27 ; % = 53	n = 33 ; % = 66

Characteristic	Multidisciplinary team - >2-4 hours, <5 days a week (N = 51)	Usual care (N = 50)
Mean age (SD) (years) Range	47 to 79	48 to 80
Mean age (SD) (years) Mean (SD)	67 (NR)	66 (NR)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity NIHSS Range	0 to 5	0 to 5
Severity NIHSS Median (IQR)	0 (NR to NR)	1 (NR to NR)
Time period since stroke Sample size	n = NA ; % = NA	n = NA ; % = NA
Subacute stage Sample size	n = 37 ; % = 73	n = 36 ; % = 72
Chronic stage	n = 14 ; % = 27	n = 14 ; % = 28

Characteristic	Multidisciplinary team - >2-4 hours, <5 days a week (N = 51)	Usual care (N = 50)
Sample size		
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 14 month (≥6 months)

Multidisciplinary team - >2-4 hours, <5 days a week compared to usual care at ≥6 months - continuous outcomes (1)

Outcome	Multidisciplinary team - >2-4 hours, <5 days a week, Baseline, N = 51	Multidisciplinary team - >2-4 hours, <5 days a week, 14 month, N = 47	Usual care, Baseline, N = 49	Usual care, 14 month, N = 40
Person/participant generic health-related quality of life (EQ-5D) Scale range: -0.11-1. Final values. Mean (p value)	0.57 (NA)	0.61 (0.66)	0.56 (NA)	0.6 (0.82)

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

Multidisciplinary team - >2-4 hours, <5 days a week compared to usual care at ≥6 months - continuous outcomes (2)

Outcome	Multidisciplinary team - >2-4 hours, <5 days a week, Baseline, N = 52	Multidisciplinary team - >2-4 hours, <5 days a week, 14 month, N = 45	Usual care, Baseline, N = 50	Usual care, 14 month, N = 41
Stroke outcome - modified Rankin scale Scale range: 0-5. Final values. Mean (p value)	2.33 (NA)	1.87 (0.002)	2.26 (NA)	2.05 (0.16)

Stroke outcome - modified Rankin scale - Polarity - Lower values are better

Multidisciplinary team - >2-4 hours, <5 days a week compared to usual care at ≥6 months - continuous outcomes (3)

Outcome	Multidisciplinary team - >2-4 hours, <5 days a week, Baseline, N = 51	Multidisciplinary team - >2-4 hours, <5 days a week, 14 month, N = 47	Usual care, Baseline, N = 50	Usual care, 14 month, N = 41
Psychological distress - Depression (HAD-Depression) Scale range: 0-21 Mean (p value)	5.37 (NA)	4.74 (0.56)	5.86 (NA)	4.9 (0.029)

Psychological distress - Depression (HAD-Depression) - Polarity - Lower values are better

Multidisciplinary team - >2-4 hours, <5 days a week compared to usual care at ≥6 months - dichotomous outcome

Outcome	Multidisciplinary team - >2-4 hours, <5 days a week, Baseline, N = 51	Multidisciplinary team - >2-4 hours, <5 days a week, 14 month, N = 51	Usual care, Baseline, N = 50	Usual care, 14 month, N = 50
Discontinuation Intervention: 2 deceased, 1	n = NA ; % = NA	n = 3 ; % = 6	n = NA ; % = NA	n = 9 ; % = 18

Outcome	Multidisciplinary team - >2-4 hours, <5 days a week, Baseline, N = 51	Multidisciplinary team - >2-4 hours, <5 days a week, 14 month, N = 51	Usual care, Baseline, N = 50	Usual care, 14 month, N = 50
dropout. Control: 2 deceased, 7 dropout. No of events				

Discontinuation - Polarity - Lower values are better

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

Multidisciplinaryteam->2-4hours,<5daysaweekcomparedtousualcareat≥6months-continuousoutcomes(1)-Person/participantgenerichealth-relatedqualityoflife(EQ-5D)-MeanPValue-Multidisciplinary team - >2-4 hours, <5 days a week-Usual care-t14

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

Multidisciplinaryteam->2-4hours,<5daysaweekcomparedtousualcareat≥6months-continuousoutcomes(2)-Strokeoutcome-modifiedRankinscale-MeanPValue-Multidisciplinary team - >2-4 hours, <5 days a week-Usual care-t14

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Multidisciplinaryteam->2-4hours,<5daysaweekcomparedtousualcareat≥6months-continuousoutcomes(3)-Psychologicaldistress-Depression(HAD-Depression)-MeanPValue-Multidisciplinary team - >2-4 hours, <5 days a week-Usual care-t14

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

Multidisciplinaryteam->2-4hours,<5daysaweekcomparedtousualcareat≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Multidisciplinary team - >2-4 hours, <5 days a week-Usual care-t14

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

Park, 2017

Bibliographic Reference	Park, D. S.; Lee, D. G.; Lee, K.; Lee, G.; Effects of Virtual Reality Training using Xbox Kinect on Motor Function in Stroke Survivors: a Preliminary Study; Journal of stroke and cerebrovascular diseases; 2017; vol. 26 (no. 10); 2313-2319

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	Inpatient at the rehabilitation centre
Study dates	No additional information
Sources of funding	No financial or nonfinancial competing interest exists for either of this paper's authors
Inclusion criteria	More than 6 months between stroke and randomization; hemiplegic stroke as diagnosed by a neurologist; a total score of 21 or greater on the Mini-Mental State Examination; no problems with auditory or visual functioning; an ability to walk more than 10 meters with or without assistive devices; not taking any medication that could influence balance; stable vital signs; a capacity to provide informed consent.
Exclusion criteria	Severe conditions that require medical care, such as uncontrolled blood pressure of angina; musculoskeletal impairments of the lower extremity; psychological conditions; the refusal to use a video game.

Recruitment / selection of participants	Inpatients at the rehabilitation centre with a clinical diagnosis of hemiplegic stroke
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=12 Received virtual reality training using Xbox Kinect-based game and conventional physical therapy (30 minute VR training session, followed by 30 minute session of physical therapy). For the VR training, the Xbox Kinect system, which consists of a Kinect sensor and console, was used. The Kinect sensor is an infrared camera that can recognize the positions and motions of the played without the need for a special controller. The console controls the various games. For the VR training, the Xbox Kinect, console and monitor were set up in a dedicated space. The patient was placed 1.5-2m away from the Kinect sensor. Before the start of the training session, the research assistant adjusted the position of the sensor while the patient was sitting to ensure optimal position and motion capture, and loaded games into the system. After the setup was completed, the research assistant demonstrated games included in the Kinect Sports Pack and the Kinect Sports Pack 2. For the training, the following games were used: boxing, table tennis and soccer from the Kinect Sports Pack; and golf, ski and football from the Kinect Sports Pack 2. All games required the use of the upper and lower extremities while standing. All games were provided to kindle the interest of subjects with stroke. If a subject exhibited fatigue, abnormalities in breathing, or complained of pain, training was stopped immediately. The games were adaptable to patients with different levels of function after stroke. Verbal encouragement was provided by a therapist to elicit maximal effort. Following a demonstration of the games, participants stood up and practiced the games. To prevent fall events during training, patients with stroke performed standing activities with a harness mounted to the ceiling. Conducted for 6 weeks. Concomitant therapy: Conventional physical therapy. Included tasks from the traditional treatment program, which included a range of motion exercises, muscle strengthening, functional training, balance training and gait training. The specific tasks were selected by the therapist based on the requirement of each patient. Usually, the techniques of neurodevelopmental treatment and proprioceptive neuromuscular facilitation were selected by the physical therapists in charge. The program was performed for 30 minutes.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Mixed
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=12 Conventional physical therapy only for 6 weeks. Concomitant therapy: Conventional physical therapy. Included tasks from the traditional treatment program, which included a range of motion exercises, muscle strengthening, functional training, balance training and gait training. The specific tasks were selected by the therapist based on the requirement of each patient. Usually, the techniques of neurodevelopmental treatment and proprioceptive neuromuscular facilitation were selected by the physical therapists in charge. The program was performed for 30 minutes.
Number of participants	24
Duration of follow-up	6 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Person factors Fatigue - People stopped the activity if they experienced fatigue Intervention factors Individual therapy

	Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - lots of games provided with no limitations on what the person could do, and so choice was available Need for technical support and training Physical environment - people required a harness to hold them in place while they did the intervention Environmental factors Hospital care Use of expensive equipment
Additional comments	No additional information. Excludes 2 people from both arms from the analysis, so likely not ITT.

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 12)
Received virtual reality training using Xbox Kinect-based game and conventional physical therapy (30 minute VR training session, followed by 30 minute session of physical therapy). For the VR training, the Xbox Kinect system, which consists of a Kinect sensor and console, was used. The Kinect sensor is an infrared camera that can recognize the positions and motions of the played without the need for a special controller. The console controls the various games. For the VR training, the Xbox Kinect, console and monitor were set up in a dedicated space. The patient was placed 1.5-2m away from the Kinect sensor. Before the start of the training session, the research assistant adjusted the position of the sensor while the patient was sitting to ensure optimal position and motion capture, and

loaded games into the system. After the setup was completed, the research assistant demonstrated games included in the Kinect Sports Pack and the Kinect Sports Pack 2. For the training, the following games were used: boxing, table tennis and soccer from the Kinect Sports Pack; and golf, ski and football from the Kinect Sports Pack 2. All games required the use of the upper and lower extremities while standing. All games were provided to kindle the interest of subjects with stroke. If a subject exhibited fatigue, abnormalities in breathing, or complained of pain, training was stopped immediately. The games were adaptable to patients with different levels of function after stroke. Verbal encouragement was provided by a therapist to elicit maximal effort. Following a demonstration of the games, participants stood up and practiced the games. To prevent fall events during training, patients with stroke performed standing activities with a harness mounted to the ceiling. Conducted for 6 weeks. Concomitant therapy: Conventional physical therapy. Included tasks from the traditional treatment program, which included a range of motion exercises, muscle strengthening, functional training, balance training and gait training. The specific tasks were selected by the therapist based on the requirement of each patient. Usually, the techniques of neurodevelopmental treatment and proprioceptive neuromuscular facilitation were selected by the physical therapists in charge. The program was performed for 30 minutes.

Physiotherapy - </=45 minutes, 5 days a week (N = 12)
Conventional physical therapy only for 6 weeks. Concomitant therapy: Conventional physical therapy. Included tasks from the traditional treatment program, which included a range of motion exercises, muscle strengthening, functional training, balance training and gait training. The specific tasks were selected by the therapist based on the requirement of each patient. Usually, the techniques of neurodevelopmental treatment and proprioceptive neuromuscular facilitation were selected by the physical therapists in charge. The program was performed for 30 minutes.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 12)	Physiotherapy - </=45 minutes, 5 days a week (N = 12)
% Female Sample size	n = 5 ; % = 50	n = 5 ; % = 50

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 12)	Physiotherapy - </=45 minutes, 5 days a week (N = 12)
Mean age (SD) (years) Mean (SD)	62 (17.14)	65.3 (10.51)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Mean (SD)	10.78 (7.06)	14.1 (7.73)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 10	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 12	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 10
Physical function - lower limb (Fugl-Meyer Assessment of Lower Extremity) Scale range: 0-34. Change scores. Mean (SD)	16.3 (10.52)	9.8 (4.85)	21.3 (8.82)	6.2 (5.22)

Physical function - lower limb (Fugl-Meyer Assessment of Lower Extremity) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 12	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 12	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 12	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 12
Discontinuation Intervention: 2 discharged before end of intervention. Control: 2 did not conform to the required participation regimen in physical therapy sessions. No of events	n = NA ; % = NA	n = 2 ; % = 17	n = NA	n = 2

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(Fugl-MeyerAssessmentofLowerExtremity)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Park, 2011

Bibliographic Reference	Park, H. J.; Oh, D. W.; Kim, S. Y.; Choi, J. D.; Effectiveness of community-based ambulation training for walking function of post-stroke hemiparesis: a randomized controlled pilot trial; Clinical Rehabilitation; 2011; vol. 25 (no. 5); 451-9

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	Inpatient rehabilitation hospital
Study dates	No additional information
Sources of funding	This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.
Inclusion criteria	The first stroke had occurred six months to five years before the study; a walking speed of <0.7m/s, which indicates unsafe community ambulation
Exclusion criteria	Auditory or visual deficits; orthopedic or cardiovascular conditions that may interfere with the study; cognitive impairment (>25 in Mini-Mental State Examination)
Recruitment / selection of participants	People receiving inpatient management service in a rehabilitation hospital who volunteered to participate

Intervention(s)	Physiotherapy - >1 hour to 2 hours, 5 days a week N=14 Community-based ambulation training, which was performed for an hour, once a day, three times a week for four weeks. The community-based ambulation training programme consisted of four-phase walking training performed in various community situations, which were differently applied according to a weekly schedule. The difficulty level was increased every week, with different environmental demands in each session. Walking training was conducted at various locations: the foyer of a hospital, a pavement, stairs, a ramp, a car park, a pedestrian crossing and a shopping centre). Although it was planned that the subjects would progress to the next phase at the end of the week, they were allowed to proceed to the next phase if they could walk for 300m of the given walking route of each phase without a rest interval. Concomitant therapy: Routine physical therapy based on the Bobath concept daily for an hour. The functional training consisted of standing up from a sitting position, therapist-guided movement of the trunk and lower limb to stimulate normal walking pattern, forward and backward stepping of affected and unaffected lower limb, and stair climbing.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=13 Routine physical therapy only. Concomitant therapy: Routine physical therapy based on the Bobath concept daily for an hour. The functional training consisted of standing up from a sitting position, therapist-guided movement of the trunk and lower limb to stimulate normal walking pattern, forward and backward stepping of affected and unaffected lower limb, and stair climbing.
Number of participants	27

Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No additional information on method of analysis. Does not appear to be ITT as people drop out but aren't accounted for in the analysis.

Study arms

Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 14)
Community-based ambulation training, which was performed for an hour, once a day, three times a week for four weeks. The community-based ambulation training programme consisted of four-phase walking training performed in various community situations, which were differently applied according to a weekly schedule. The difficulty level was increased every week, with different environmental demands in each session. Walking training was conducted at various locations: the foyer of a hospital, a pavement, stairs, a ramp, a car park, a pedestrian crossing and a shopping centre). Although it was planned that the subjects would progress to the next phase at the end of the week, they were allowed to proceed to the next phase if they could walk for 300m of the given walking route of each phase without a rest interval. Concomitant therapy: Routine physical therapy based on the Bobath concept daily for an hour. The functional training consisted of standing up from a sitting position, therapist-guided movement of the trunk and lower limb to stimulate normal walking pattern, forward and backward stepping of affected and unaffected lower limb, and stair climbing.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Routine physical therapy only. Concomitant therapy: Routine physical therapy based on the Bobath concept daily for an hour. The functional training consisted of standing up from a sitting position, therapist-guided movement of the trunk and lower limb to stimulate normal walking pattern, forward and backward stepping of affected and unaffected lower limb, and stair climbing.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 14)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)**
% Female Sample size	n = 6 ; % = 46	n = 7 ; % = 58
Mean age (SD) (years) Mean (SD)	59.38 (8.46)	56.92 (7.79)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR

Characteristic	Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 14)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Time period since stroke (Months) Mean (SD)	28.08 (12.59)	28.67 (17.96)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 14	Physiotherapy - >1 hour to 2 hours, 5 days a week, 4 week, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 12
Physical function - lower limb (6-minute walk test) (meters) Change scores Mean (SD)	166.23 (58.29)	67 (48.78)	151.83 (69.95)	23.75 (61.45)

Physical function - lower limb (6-minute walk test) - Polarity - Higher values are better

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 14	Physiotherapy - >1 hour to 2 hours, 5 days a week, 4 week, N = 14	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 13
Discontinuation 1 drop out to both study arms (reason not given) No of events	n = NA ; % = NA	n = 1 ; % = 7	n = NA ; % = NA	n = 1

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(6-minutewalktest)-MeanSD-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Park, 2014

Bibliographic Reference	Park, S. W.; Lee, K. J.; Shin, D. C.; Shin, S. H.; Lee, M. M.; Song, C. H.; The effect of underwater gait training on balance ability of stroke patients; Journal of Physical Therapy Science; 2014; vol. 26 (no. 6); 899-903

Study details

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

Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea
Study setting	People admitted to the rehabilitation hospital in Incheon
Study dates	No additional information
Sources of funding	No additional information.
Inclusion criteria	People at more than six months and less than two years since stroke onset; those who could move at least 10 meters with the help of an assistive instrument or a person
Exclusion criteria	Those who had cardiovascular disease, such as cardiac failure or arrhythmia; those who were receiving medical treatment that would have affected their abilities; those with a pulse rate of more than 180mmHg or a relaxation blood pressure of more than 110mmHg; those who could not understand verbal instructions due to serious perception impairment; cognitive impairment; communication disability etc.; could not use the evaluation equipment.; those who had cardiovascular disease, such as cardiac failure or arrhythmia; those who were receiving medical treatment that would have affected their abilities; those with a pulse rate of more than 180mmHg or a relaxation blood pressure of more than 110mmHg; those who could not understand verbal instructions due to serious perception impairment; cognitive impairment; communication disability etc.; could not use the evaluation equipment.
Recruitment / selection of participants	People admitted to a rehabilitation hospital in Incheon enrolled in this study
Intervention(s)	Physiotherapy - >1 hour to 2 hours, 5 days a week N=11 The underwater gait program. Beginning with a warm up in the water for 5 minutes to establish psychological stability and prevent accidents. The main exercise was carried out for 30 minutes. At the end of the main exercise, cool-down exercises were carried out for 5 minutes including stretching to relax muscle tension and recovery muscle fatigue. Training was

	performed twice a week for 4 weeks. The initial speed of the underwater treadmill training was set at 36% of each subject's ground gait speed. The speed was increased in increments of 0.1m/s, to maintain comfort and good gait patterns, to the maximum ability of the subjects. The training speed of the next day began at the maximum speed of the previous day, and the speed was lowered when the alignment of the trunk and limbs was abnormal or the gait was unbalanced due to the treadmill speed being faster than a subject's ability to comfortably perform gait. Training was performed twice a week for 30 minutes over a four week period, and the subjects wore water shoes to prevent slipping on the treadmill foothold. The pool water temperature for the gait training was 34 degrees centigrade and the water depth was adjusted to each patient's xiphoid. Conventional therapy: General rehabilitation program composed of motor exercise, functional electrical stimulation and occupational therapy. The motor exercises were performed five times a week, once per day, for 30 minutes. The motor exercises consisted of postural control, gait training, and balance training. The program was conducted taking into consideration patients' levels for development of the central nervous system. Muscular strength training was carried out using the apparatus for 30 minutes. Functional electrical stimulation was applied to the upper and lower extremities for 15 minutes each. Occupational therapy was performed for activities of daily living as upper extremity training, five times per week, once a day for 30 minutes each time.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=11 General rehabilitation program only. Conventional therapy: General rehabilitation program composed of motor exercise, functional electrical stimulation and occupational therapy. The motor exercises were performed five times a week, once per day, for 30 minutes. The motor exercises consisted of postural control, gait training, and balance training. The program was conducted taking into

	consideration patients' levels for development of the central nervous system. Muscular strength training was carried out using the apparatus for 30 minutes. Functional electrical stimulation was applied to the upper and lower extremities for 15 minutes each. Occupational therapy was performed for activities of daily living as upper extremity training, five times per week, once a day for 30 minutes each time.
Number of participants	22
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No additional information. Excludes people who completed less than 80% of the trial.

Study arms

Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 11)
The underwater gait program. Beginning with a warm up in the water for 5 minutes to establish psychological stability and prevent accidents. The main exercise was carried out for 30 minutes. At the end of the main exercise, cool-down exercises were carried out for 5 minutes including stretching to relax muscle tension and recovery muscle fatigue. Training was performed twice a week for 4 weeks.

The initial speed of the underwater treadmill training was set at 36% of each subject's ground gait speed. The speed was increased in increments of 0.1m/s, to maintain comfort and good gait patterns, to the maximum ability of the subjects. The training speed of the next day began at the maximum speed of the previous day, and the speed was lowered when the alignment of the trunk and limbs was abnormal or the gait was unbalanced due to the treadmill speed being faster than a subject's ability to comfortably perform gait. Training was performed twice a week for 30 minutes ove ra four week period, and the subjects wore water shoes to prevent slipping on the treadmill foothold. The pool water temperature for the gait training was 34 degrees centigrade and the water depth was adjusted to each patient's xiphoid. Conventional therapy: General rehabilitation program composed of motor exercise, functional electrical stimulation and occupational therapy. The motor exercises were performed five times a week, once per day, for 30 minutes. The motor exercises consisted of postural control, gait training, and balance training. The program was conducted taking into consideration patients' levels for development of the central nervous system. Muscular strength training was carried out using the apparatus for 30 minutes. Functional electrical stimulation was applied to the upper and lower extremities for 15 minutes each. Occupational therapy was performed for activities of daily living as upper extremity training, five times per week, once a day for 30 minutes each time.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
General rehabilitation program only. Conventional therapy: General rehabilitation program composed of motor exercise, functional electrical stimulation and occupational therapy. The motor exercises were performed five times a week, once per day, for 30 minutes. The motor exercises consisted of postural control, gait training, and balance training. The program was conducted taking into consideration patients' levels for development of the central nervous system. Muscular strength training was carried out using the apparatus for 30 minutes. Functional electrical stimulation was applied to the upper and lower extremities for 15 minutes each. Occupational therapy was performed for activities of daily living as upper extremity training, five times per week, once a day for 30 minutes each time.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >1 hour to 2 hours, 5 days a week (N = 11)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 11)
% Female Sample size	n = 4 ; % = 40	n = 5 ; % = 50
Mean age (SD) (years) Mean (SD)	61.8 (12)	60.6 (11.8)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (Months) Range	6 to 24	6 to 24
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - continuous outcome

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 11	Physiotherapy - >1 hour to 2 hours, 5 days a week, 4 week, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 10
Physical function - lower limb (dynamic balance ability) Scale range: Unclear. Change scores. Mean (SD)	3.7 (1.7)	-1.1 (1.2)	3.9 (1.2)	-0.9 (1.2)

Physical function - lower limb (dynamic balance ability) - Polarity - Lower values are better

Physiotherapy - >1 hour to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 11	Physiotherapy - >1 hour to 2 hours, 5 days a week, 4 week, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 11
Discontinuation Intervention: 1 discharged for personal reasons. Control: 1	n = NA ; % = NA	n = 1 ; % = 9	n = NA	n = 1 ; % = 9

Outcome	Physiotherapy - >1 hour to 2 hours, 5 days a week, Baseline, N = 11	Physiotherapy - >1 hour to 2 hours, 5 days a week, 4 week, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 11	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 11
injured in an accident caused by a fall. No of events				

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-continuousoutcome-Physicalfunction-lowerlimb(dynamicbalanceability)-MeanSD-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Physiotherapy->1hourto2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 hour to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Park, 2021

Bibliographic Reference	Park, Y. S.; An, C. S.; Lim, C. G.; Effects of a rehabilitation program using a wearable device on the upper limb function, performance of activities of daily living, and rehabilitation participation in patients with acute stroke; International Journal of Environmental Research and Public Health; 2021; vol. 18 (no. 11)

Study details

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

Study location	Republic of Korea
Study setting	Inpatient
Sources of funding	This research received no external funding.
Inclusion criteria	Acute phase stroke at least 1 month from the date of onset among hemiplegic patients diagnosed with stroke based on magnetic resonance imaging or computer tomography; a score of at least 20 points on the Mini-Mental Status Examination Korean version; willingness to comply with the therapist's instructions.
Exclusion criteria	Unable to remain independently seated for at least 30 minutes or to manipulate the smart gloves while showing modified Ashworth scale G3 or above for the upper limb; visual or auditory dysfunction or defect; musculoskeletal disorder in the upper limb.
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=22 A game-based virtual reality rehabilitation program of 30 minutes per session, 5 sessions per week for 4 weeks. Using the RAPAEL Smart GloveTM, for 30 minutes per day, 5 days a week, 20 times in total during the 4 week period. The game-based functional training and activities of daily living (catching butterflies and balls, squeezing and orange, fishing, cooking, floor cleaning, wine pouring, fence painting and page-turning). Concomitant therapy: Conventional physical therapy, 30 minutes per session, 5 days a week during the 4 week training period. This was based on training to improve upper limb function in stroke patients. According to the patient's performance ability, training was repeated in consideration of the difficulty level, and assistance was provided.
Intervention stratification - Type of therapist	Physiotherapy

Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Not stated/unclear
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=22 Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 30 minutes per session, 5 days a week during the 4 week training period. This was based on training to improve upper limb function in stroke patients. According to the patient's performance ability, training was repeated in consideration of the difficulty level, and assistance was provided.
Number of participants	44
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Telerehabilitation, assistive technology and computer-based tools Environmental factors Hospital care

	Use of expensive equipment
Additional comments	ITT (no discontinuations)

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 22)
A game-based virtual reality rehabilitation program of 30 minutes per session, 5 sessions per week for 4 weeks. Using the RAPAEL Smart GloveTM, for 30 minutes per day, 5 days a week, 20 times in total during the 4 week period. The game-based functional training and activities of daily living (catching butterflies and balls, squeezing and orange, fishing, cooking, floor cleaning, wine pouring, fence painting and page-turning). Concomitant therapy: Conventional physical therapy, 30 minutes per session, 5 days a week during the 4 week training period. This was based on training to improve upper limb function in stroke patients. According to the patient's performance ability, training was repeated in consideration of the difficulty level, and assistance was provided.

Physiotherapy - </=45 minutes, 5 days a week (N = 22)
Conventional physical therapy only. Concomitant therapy: Conventional physical therapy, 30 minutes per session, 5 days a week during the 4 week training period. This was based on training to improve upper limb function in stroke patients. According to the patient's performance ability, training was repeated in consideration of the difficulty level, and assistance was provided.

Characteristics

Arm-level characteristics

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 22)	Physiotherapy - </=45 minutes, 5 days a week (N = 22)
% Female	n = 10 ; % = 45.5	n = 10 ; % = 45.5

Characteristic	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 22)	Physiotherapy - </=45 minutes, 5 days a week (N = 22)
Sample size		
Mean age (SD) (years) Mean (SD)	60.59 (18.12)	62.29 (13.97)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke Sample size	n = NR ; % = NR	n = NR ; % = NR
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - continuous outcomes

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 22	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 22	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 22	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 22
Activities of daily living (Korean version of the modified Barthel Index) Scale range: 0-100. Final values. Mean (SD)	46 (25.83)	77.68 (19.79)	49.55 (19.88)	71.18 (17.94)
Physical function - Upper limb (Fugl-Meyer Assessment) Scale range: Unclear (not 0-66). Final values. Mean (SD)	66.5 (24.43)	87.95 (14.16)	62.95 (28.81)	86 (15.97)

Activities of daily living (Korean version of the modified Barthel Index) - Polarity - Higher values are better
Physical function - Upper limb (Fugl-Meyer Assessment) - Polarity - Higher values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 22	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 4 week, N = 22	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 22	Physiotherapy - </=45 minutes, 5 days a week, 4 week, N = 22
Discontinuation 0 lost to follow up No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcomes-Activitiesofdailyliving(KoreanversionofthemodifiedBarthelIndex)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-continuousoutcomes-Physicalfunction-Upperlimb(Fugl-MeyerAssessment)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t4

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

Partridge, 2000

Bibliographic Reference	Partridge, C.; Mackenzie, M.; Edwards, S.; Reid, A.; Jayawardena, S.; Guck, N.; Potter, J.; Is dosage of physiotherapy a critical factor in deciding patterns of recovery from stroke: a pragmatic randomized controlled trial; Physiotherapy Research International; 2000; vol. 5 (no. 4); 230-40

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	United Kingdom
Study setting	Outpatient care
Study dates	No additional information
Sources of funding	This project was funded jointly by South East Thames R&D Directorate and East Kent Health Authority.
Inclusion criteria	All people with a diagnosis of stroke, according to the WHO (1989) criteria, admitted over a two-year period to the Canterbury Stroke Unity, who fulfilled the study criteria and gave their informed consent to participate in the study.
Exclusion criteria	Other intercurrent serious illness; poor mental state; Hodgkinson's score >8/10; absence of physical disability (as assessed on the Profiles of Recovery scale).

Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=60 Standard plus therapy (60 minutes/day). The Bobath method of treatment was used (as this is the most widely used in the UK) delivered by a clinical consultant and three clinical physiotherapists. The aims of treatment included: mid-line alignment, postural adjustment, symmetry and control; maintenance of full range of movement; working to improve base of support; facilitating all aspects of transfers; modifying muscle tone; sequencing of movements; balance re-education, stability and transfer of weight; inhibition of positive support reaction; working on shoulder girdle and scapulo-humeral rhythm; facilitating functional hand/arm movements; all aspects of re-education of gait, including knee and foot control; 'other' category to be specified. Concomitant therapy: No additional information.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Not stated/unclear

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - </=45 minutes, 5 days a week N=54 Standard therapy (30 minutes/day). Same therapy type as the control. Concomitant therapy: No additional information.

Number of participants	114
Duration of follow-up	6 weeks (end of intervention), 6 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Environmental factors: Hospital care
Additional comments	No information about method of analysis

Study arms

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 60)
Standard plus therapy (60 minutes/day). The Bobath method of treatment was used (as this is the most widely used in the UK) delivered by a clinical consultant and three clinical physiotherapists. The aims of treatment included: mid-line alignment, postural adjustment, symmetry and control; maintenance of full range of movement; working to improve base of support; facilitating all aspects of transfers; modifying muscle tone; sequencing of movements; balance re-education, stability and transfer of weight; inhibition of positive support reaction; working on shoulder girdle and scapulo-humeral rhythm; facilitating functional hand/arm movements; all aspects of re-education of gait, including knee and foot control; 'other' category to be specified. Concomitant therapy: No additional information.

Physiotherapy - </=45 minutes, 5 days a week (N = 54)
Standard therapy (30 minutes/day). Same therapy type as the control. Concomitant therapy: No additional information.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 114)**
% Female Sample size	n = 62 ; % = 54
Mean age (SD) (years) Range	60 to 94
Mean age (SD) (years) Mean (SD)	76.5 (NR)
Ethnicity Sample size	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR
Time period since stroke	NR (NR)

Characteristic	Study (N = 114)
Mean (SD)	
Type of communication difficulty Sample size	n = NR ; % = NR
Communication problems Sample size	n = 58 ; % = 51
Severe communication problems Sample size	n = 13 ; % = 11

Outcomes

Study timepoints

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

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week - continuous outcomes (1)

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 54	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 33	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 27	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 60	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 22	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 33
Physical function - lower limbs (timed walk) (unclear) Final values. Mean (SD)	NR (NR)	49.2 (32)	35.8 (16.5)	NR (NR)	39.9 (29.9)	49.4 (32.1)

Physical function - lower limbs (timed walk) - Polarity - Lower values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week - continuous outcomes (2)

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 34	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 46	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 43	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 34	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 46	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 43
Psychological distress - depression (Hospital Anxiety and Depression scale)	15 (7.9)	12.6 (7.6)	12.9 (7.9)	15.5 (8.2)	12.9 (7.1)	12.9 (7)

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 34	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 46	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 43	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 34	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 46	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 43
Scale range: 0-42. Final values. Mean (SD)						

Psychological distress - depression (Hospital Anxiety and Depression scale) - Polarity - Lower values are better

Physiotherapy - >45 minutes to 1 hour, 5 days a week compared to Physiotherapy - </=45 minutes, 5 days a week - dichotomous outcome

Outcome	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 60	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 week, N = 60	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 60	Physiotherapy - </=45 minutes, 5 days a week, Baseline, N = 54	Physiotherapy - </=45 minutes, 5 days a week, 6 week, N = 54	Physiotherapy - </=45 minutes, 5 days a week, 6 month, N = 54
Discontinuation 6 weeks: intervention = 4, control = 2. 6 months: intervention = 11, control = 10. No of events	n = NA ; % = NA	n = 4 ; % = 7	n = 11 ; % = 18	n = NA ; % = NA	n = 2 ; % = 4	n = 10 ; % = 19

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-continuousoutcomes(1)-Physicalfunction-lowerlimbs(timedwalk)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-continuousoutcomes(1)-Physicalfunction-lowerlimbs(timedwalk)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6m

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-continuousoutcomes(2)-Psychologicaldistress-depression(HospitalAnxietyandDepressionscale)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-continuousoutcomes(2)-Psychologicaldistress-depression(HospitalAnxietyandDepressionscale)-MeanSD-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6m

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6

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

Physiotherapy->45minutesto1hour,5daysaweekcomparedtoPhysiotherapy-</=45minutes,5daysaweek-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >45 minutes to 1 hour, 5 days a week-Physiotherapy - </=45 minutes, 5 days a week-t6m

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

Pervane Vural, 2016

Bibliographic Reference	Pervane Vural, S.; Nakipoglu Yuzer, G. F.; Sezgin Ozcan, D.; Demir Ozbudak, S.; Ozgirgin, N.; Effects of Mirror Therapy in Stroke Patients With Complex Regional Pain Syndrome Type 1: A Randomized Controlled Study; Archives of Physical Medicine & Rehabilitation; 2016; vol. 97 (no. 4); 575-581

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	No additional information
Trial name / registration number	No additional information
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	Inpatient rehabilitation center
Study dates	November 2011 and September 2012
Sources of funding	No additional information

Inclusion criteria	First episode of hemiplegia after stroke diagnosed by a neurologist within 12 months; presence of concomitant dystrophic (intermediate) stage of CRPS type 1; the Mini Mental State Examination score >23
Exclusion criteria	Unstable medical status; visual impairment; shoulder subluxation; history of an injection to the shoulder in the last 6 months; presence of neglect; presence of another reason for upper limb pain; presence of concomitant progressive central nervous system disorder; history of hand dysfunction in the affected side.
Recruitment / selection of participants	People with hemiplegia evaluated in the inpatient rehabilitation centre
Intervention(s)	Physiotherapy - >4 hours, 5 days a week N=15 An additional mirror therapy program for 30 minutes/day. During the mirror therapy program, the patient was seated on a chair close to a table with a mirror (35 x 35cm) positioned vertically between the patient's upper limbs. The unaffected arm was placed in a suitable box, which made it invisible. Patients were trained to perform various movements of the unaffected side: flexion and extension of the elbow, wrist and fingers; supination and pronation of the forearm; and abduction, adduction and opposition of the fingers. The patients were asked to look in the mirror constantly during the exercise and imagine that the reflection belonged to the affected side. In addition, patients were told to try to do the same movements with the unaffected side. All sessions were performed by the same practitioners for all of the patients. Concomitant therapy: Patient-specific conventional stroke rehabilitation program for 4 weeks, 5 days a week for 2-4 hours/day. The conventional program consisted of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required).
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information

Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists

Comparator	Physiotherapy - >2 hours to 4 hours, 5 days a week N=15 Conventional stroke rehabilitation program only. Concomitant therapy: Patient-specific conventional stroke rehabilitation program for 4 weeks, 5 days a week for 2-4 hours/day. The conventional program consisted of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required).
Number of participants	30
Duration of follow-up	4 weeks (post-intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Environmental factors Hospital care
Additional comments	No additional information on method of analysis. No one discontinued from the study (ITT no discontinuation)

Study arms

Physiotherapy - >4 hours, 5 days a week (N = 15)
An additional mirror therapy program for 30 minutes/day. During the mirror therapy program, the patient was seated on a chair close to a table with a mirror (35 x 35cm) positioned vertically between the patient's upper limbs. The unaffected arm was placed in a suitable box, which made it invisible. Patients were trained to perform various movements of the unaffected side: flexion and extension of the elbow, wrist and fingers; supination and pronation of the forearm; and abduction, adduction and opposition of the fingers. The patients were asked to look in the mirror constantly during the exercise and imagine that the reflection belonged to the affected side. In addition, patients were told to try to do the same movements with the unaffected side. All sessions were performed by the same practitioners for all of the patients. Concomitant therapy: Patient-specific conventional stroke rehabilitation program for 4 weeks, 5 days a week for 2-4 hours/day. The conventional program consisted of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required).

Physiotherapy - >2 hours to 4 hours, 5 days a week (N = 15)
Conventional stroke rehabilitation program only. Concomitant therapy: Patient-specific conventional stroke rehabilitation program for 4 weeks, 5 days a week for 2-4 hours/day. The conventional program consisted of neurodevelopmental facilitation techniques, occupational therapy, physiotherapy and speech therapy (if required).

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >4 hours, 5 days a week (N = 15)**	**Physiotherapy - >2 hours to 4 hours, 5 days a week (N = 15)**
% Female Sample size	n = 7 ; % = 46.7	n = 6 ; % = 40
Mean age (SD) (years) Mean (SD)	68.9 (10.5)	61.4 (11.9)

Characteristic	Physiotherapy - >4 hours, 5 days a week (N = 15)	Physiotherapy - >2 hours to 4 hours, 5 days a week (N = 15)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Range	60 to 210	65 to 240
Time period since stroke (days) Mean (SD)	120 (NR)	180 (NR)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Physiotherapy - >4 hours, 5 days a week compared to Physiotherapy - 2 hours to 4 hours, 5 days a week at <6 months - dichotomous outcome

Outcome	Physiotherapy - >4 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >4 hours, 5 days a week, 4 week, N = 15	Physiotherapy - >2 hours to 4 hours, 5 days a week, Baseline, N = 15	Physiotherapy - >2 hours to 4 hours, 5 days a week, 4 week, N = 15
Discontinuation No discontinuations No of events	n = NA ; % = NA	n = 0 ; % = 0	n = NA ; % = NA	n = 0 ; % = 0

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->4hours,5daysaweekcomparedtoPhysiotherapy-2hoursto4hours,5daysaweekat<6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >4 hours, 5 days a week-Physiotherapy - 2 hours to 4 hours, 5 days a week-t4

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

Peurala, 2009

Bibliographic Reference	Peurala, S. H.; Airaksinen, O.; Huuskonen, P.; Jäkälä, P.; Juhakoski, M.; Sandell, K.; Tarkka, I. M.; Sivenius, J.; Effects of intensive therapy using gait trainer or floor walking exercises early after stroke; Journal of rehabilitation medicine; 2009; vol. 41 (no. 3); 166-173

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	Finland
Study setting	Inpatient rehabilitation in the acute care hospital
Study dates	January 2005 and February 2007
Sources of funding	This study was supported by the Brain Research and Rehabilitation Center Neuron, Kuopio, Finland, the Department of Neurology, University of Kuopio, and Kuopio University Hospital, Kuopio, Finland (grant # EVO477338, 57/2003, 36/2004) and Academy of Finland (grant #114291).
Inclusion criteria	First supratentorial stroke or no significant disturbance from an earlier stroke (Modified Rankin Scale 0-2); Functional Ambulatory Category 0-3; voluntary movement in the leg of the affected side; Barthel Index 25-75 points; age 18-85 years; body mass index <32

Exclusion criteria	Unstable cardiovascular disease; severe malposition of joints; severe cognitive or communicative disorders
Recruitment / selection of participants	No additional information
Intervention(s)	Physiotherapy - >1 to 2 hours, 5 days a week N=43 Two groups: 1) gait trainer exercise, 2) walking training over ground. 15 sessions of either intervention over 3 weeks in addition to usual physiotherapy. A maximum of 1 hour/day therapy in order to obtain 20 minutes of actual walking either in the electromechanical gait trainer or over ground. In the gait trainer, the patient was supported with a harness and his or her feet were placed on motor-driven footplates. The amount of body weight support provided by the harness was chosen according to the patient's individual needs. In the walking over ground group they walked with 1 or 2 physiotherapists, using their individual walking aids. The training was progressed by increasing the speed and decreasing the amount of body weight support or manual guidance and reliance on walking aids. Concomitant therapy: Gait-oriented physiotherapy for 55 minutes daily. The content of the physiotherapy was determined according to individually set goals.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Physiotherapy - >45 minutes to 1 hour, 5 days a week N=13 Conventional therapy only.

	Concomitant therapy: Gait-oriented physiotherapy for 55 minutes daily. The content of the physiotherapy was determined according to individually set goals.
Number of participants	56
Duration of follow-up	3 weeks (end of intervention) and 6 months
Indirectness	No additional information
Elements of the study relating to qualitative themes	Intervention factors Individual therapy Goal setting Environmental factors Hospital care
Additional comments	No additional information. Does not appear to be ITT.

Study arms

Physiotherapy - >1 to 2 hours, 5 days a week (N = 43)
Two groups: 1) gait trainer exercise, 2) walking training over ground. 15 sessions of either intervention over 3 weeks in addition to usual physiotherapy. A maximum of 1 hour/day therapy in order to obtain 20 minutes of actual walking either in the electromechanical gait trainer or over ground. In the gait trainer, the patient was supported with a harness and his or her feet were placed on motor-driven footplates. The amount of body weight support provided by the harness was chosen according to the patient's individual needs. In the walking over ground group they walked with 1 or 2 physiotherapists, using their individual walking aids. The training was progressed by increasing the speed and decreasing the amount of body weight support or manual guidance and reliance on walking aids. Concomitant therapy: Gait-oriented physiotherapy for 55 minutes daily. The content of the physiotherapy was determined according to individually set goals.

Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Conventional therapy only. Concomitant therapy: Gait-oriented physiotherapy for 55 minutes daily. The content of the physiotherapy was determined according to individually set goals.

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1 to 2 hours, 5 days a week (N = 43)**	**Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)**
% Female Sample size	n = 18 ; % = 49	n = 5 ; % = 50
Mean age (SD) (years) Mean (SD)	65.5 (9.6)	69.5 (11)

Characteristic	Physiotherapy - >1 to 2 hours, 5 days a week (N = 43)	Physiotherapy - >45 minutes to 1 hour, 5 days a week (N = 13)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NR ; % = NR	n = NR ; % = NR
Time period since stroke (days) Mean (SD)	8.2 (2.7)	9.5 (1.9)
Type of communication difficulty Amount with aphasia Sample size	n = 12 ; % = 32	n = 3 ; % = 30

Outcomes

Study timepoints

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

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - continuous outcomes

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 43	Physiotherapy - >1 to 2 hours, 5 days a week, 3 week, N = 37	Physiotherapy - >1 to 2 hours, 5 days a week, 6 month, N = 35	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 3 week, N = 10	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 10
Physical function - lower limb (Rivermead Motor Assessment) Scale range: 0-13. Final values. In order to combine the values for the physiotherapy >1-2 hours group, the values were converted from mean (95% CI) to mean (SD) Mean (SD)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)
Rivermead Motor Assessment Gross motor function subscale Mean (SD)	4.1 (3)	8.4 (3.4)	10.8 (2.7)	2.3 (2.7)	6.3 (3.2)	8.8 (2.5)
Rivermead Motor Assessment subscale of leg and trunk Mean (SD)	3.6 (2.4)	6.9 (2.8)	7.8 (2.6)	2.7 (2.2)	4.5 (2.7)	5.8 (2.4)

Physical function - lower limb (Rivermead Motor Assessment) - Polarity - Higher values are better

Physiotherapy - >1 to 2 hours, 5 days a week compared to Physiotherapy - >45 minutes to 1 hour, 5 days a week at <6 months and ≥6 months - dichotomous outcome

Outcome	Physiotherapy - >1 to 2 hours, 5 days a week, Baseline, N = 43	Physiotherapy - >1 to 2 hours, 5 days a week, 3 week, N = 43	Physiotherapy - >1 to 2 hours, 5 days a week, 6 month, N = 43	Physiotherapy - >45 minutes to 1 hour, 5 days a week, Baseline, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 3 week, N = 13	Physiotherapy - >45 minutes to 1 hour, 5 days a week, 6 month, N = 13
Discontinuation <6 months. Intervention: 2 worsening of situation after 1-2 treatment days, 1 2x unsuccessful attempts in the gait trainer, 1 scheduling problems after 5 treatment days, 1 felt the protocol was too demanding after 8 treatments, 1 felt the protocol too demanding after 7 treatments. Control: 1 exitus after 2 weeks since onset of stroke, 2 worsening of situation after few days. After 6 months: Intervention: 2 additional dropout. Control: 0 no additional dropout. No of events	n = NA ; % = NA	n = 6 ; % = 14	n = 8 ; % = 19	n = NA ; % = NA	n = 3 ; % = 23	n = 3 ; % = 23

Discontinuation - Polarity - Lower values are better

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(RivermeadMotorAssessment)-RivermeadMotorAssessmentGrossmotorfunctionsubscale-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(RivermeadMotorAssessment)-RivermeadMotorAssessmentGrossmotorfunctionsubscale-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-Physicalfunction-lowerlimb(RivermeadMotorAssessment)-RivermeadMotorAssessmentsubscaleoflegandtrunk-MeanSD-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-continuousoutcomes-PhysicalfunctionlowerlimbRivermeadMotorAssessmentRivermeadMotorAssessmentsubscaleoflegandtrunkMeanSDPhysiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-dichotomousoutcomeDiscontinuationNoOfEventsPhysiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t3

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

Physiotherapy->1to2hours,5daysaweekcomparedtoPhysiotherapy->45minutesto1hour,5daysaweekat<6monthsand≥6months-dichotomousoutcome-Discontinuation-NoOfEvents-Physiotherapy - >1 to 2 hours, 5 days a week-Physiotherapy - >45 minutes to 1 hour, 5 days a week-t6

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

Platz, 2005

Bibliographic Reference	Platz, T.; Eickhof, C.; van Kaick, S.; Engel, U.; Pinkowski, C.; Kalok, S.; Pause, M.; Impairment-oriented training or Bobath therapy for severe arm paresis after stroke: a single-blind, multicentre randomized controlled trial; Clinical Rehabilitation; 2005; vol. 19 (no. 7); 714-24

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR

Trial name / registration number	NR
Study location	Germany
Study setting	Inpatients and outpatients stroke rehabilitation centre
Study dates	1991 to 2002
Sources of funding	The study sponsor had no role in study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication.
Inclusion criteria	Patients were selected on the basis that (a) they had severe (incomplete) arm paresis (i.e., FuglMeyer Test Arm score (except reflex activity related scores) between 5 and 34), (b) their acute stroke had occurred between three weeks and six months ago, (c) they had no more than mild speech comprehension deficit (i.e., Hemispheric Stroke Scale, 14 comprehension score '2' or '0, (correctly following two out of three commands)), (d) they had no inability to perform the Fugl-Meyer test due to reasons not related to central arm paresis (e.g., contractures of arm joints). Type of stroke was classified according to the Bamford criteria (i.e., lacunar (LACI), partial (PACI), or total anterior circulation infarct (TACI)) The Hemispheric Stroke Scale was used for the quantification of impairment after stroke in a more general sense. The modified Barthel Index was used to document the patients' ability to cope with basic activities of daily living.
Exclusion criteria	NR
Recruitment / selection of participants	From 1999 to 2002, patients after a first clinically apparent unilateral supratentorial anterior circulation ischaemic stroke in the subacute phase were recruited during inpatient rehabilitation treatment at one of three participating departments of neurological rehabilitation: (1) the department of neurological rehabilitation of the Charite-Universitatsmedizin Berlin, Germany, (2) the neurological (rehabilitation) centre of the Segeberger Kliniken, Bad Segeberg, Germany, and (3) the neurological rehabilitation centre (NRZ) in Magdeburg, Germany.
Intervention(s)	Both treatment groups have been combined for the purposes of this review. These patients received augmented exercise therapy time with 20 additional arm training sessions (each lasting 45 min) over the course of four weeks.

	Augmented exercise therapy time was provided as either Bobath therapy (augmented exercise therapy time Bobath) or Arm BASIS training (augmented exercise therapy time BASIS). For the Bobath approach, a study manual served the experienced physiotherapists as the basis for the study treatment. Its design had been supervised by a senior Bobath instructor. The emphasis has been on control of muscle tone and recruitment of arm activity in functional situations with various positions (i.e., lying, sitting, standing, walking, both with and without objects and during unilateral or bilateral tasks). The Arm BASIS training is a systematic repetitive training technique for hemiparetic patients.' During each training session, all degrees of freedom of the arm are repetitively trained across the full range of motion. The patient is encouraged to perform selective dynamic movements across the range of motion in individual planes of individual arm joints. The training is first without active postural stabilization of the limb to promote dynamic control. The therapist substitutes for any incapacity of the patient to perform movements actively and provides feedback about any movement success (in terms of selective dynamic motion) or failure. Once selective dynamic motion across the full range of motion of single joints has been re-established, the interplay between postural stabilization and dynamic control is trained, and finally multi joint co-ordination. The training comprises three consecutive stages: 1) selective innervation for isolated motions without postural control, 2) selective innervation for isolated motions with postural control, 3) selective innervation for complex motions with postural control. At each stage the various degrees of freedom of the arm are systematically and repetitively trained. At stage 1 single-joint movements are trained with concentric contractions, but not against gravity. The aim of stage 1 is to restore (fast and forceful as well as non segmented) dynamic motion control across the full range of motion for individual joints without postural control. Single joint motions are also trained in stage 2 of the Arm BASIS training. Now, however; dynamic and postural control are combined when patients ought to perform concentric, eccentric and isometric contractions against and with gravity, against resistance, and when the moving limb is loaded with weights. The aim is to restore the full range of active motion for individual joints as well as their postural stabilization under both the influence of the limb's weight as well as external forces. Multi joint movements afford complex innervation pattern. These are specifically trained in stage 3. Here, combinations of concentric, eccentric, and isometric contractions are necessary and have to be co-ordinated across limb segments. The aim is to restore well coordinated multi joint movements under both the influence of the limb's weight as well as external forces.

	Concomitant therapy: During the four-week interval between pre- and post test, all patients received the usual standard rehabilitation therapy. The treatment made use of different therapeutic concepts and addressed various issues such as activities of daily living, arm activities, stance and gait, speech and cognition.
Population subgroups	Physiotherapist
Subgroup 1: Community-based vs. hospital-based	Mixed
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	the control group received the usual standard rehabilitation therapy. The treatment made use of different therapeutic concepts and addressed various issues such as activities of daily living, arm activities, stance and gait, speech and cognition. no details on dose or intensity provided.
Number of participants	60
Duration of follow-up	4 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	intensity tailored to the individual Intervention factors: Individual Environment factors:

	Hospital care
Additional comments	NR

Study arms

Physiotherapy >45 minutes - 1 hour, 5 days per week (N = 40)
Combined the 2 treatment groups for the purposes of this review. Patients receiving augmented exercise therapy time with conventional arm rehabilitation (augmented exercise therapy time Bobath), or patients receiving augmented exercise therapy time with impairment-oriented arm rehabilitation (augmented exercise therapy time BASIS). Both groups of patients received augmented exercise therapy time with 20 additional arm training sessions (each lasting 45 min) over the course of four weeks. Both groups also received usual care in addition to this. dose = 45 mins per day, 5 day per week + usual care

Physiotherapy </=45 minutes, 5 days per week (N = 20)
All patients received the usual standard rehabilitation therapy. The treatment made use of different therapeutic concepts and addressed various issues such as activities of daily living, arm activities, stance and gait, speech and cognition. no details on dose or intensity provided.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 60)**
Ethnicity Nominal	NR

Characteristic	Study (N = 60)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	Physiotherapy >45 minutes - 1 hour, 5 days per week (N = 40)	Physiotherapy </=45 minutes, 5 days per week (N = 20)
% Female Nominal	55	35
Mean age (SD) Mean (SD)	61.55 (11.8)	60.9 (14)
Time period since stroke Mean (SD)	6.35 (3.76)	4.6 (1.6)

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	Physiotherapy >45 minutes - 1 hour, 5 days per week, Baseline, N = 20	Physiotherapy >45 minutes - 1 hour, 5 days per week, 4 week, N = 20	Physiotherapy </=45 minutes, 5 days per week, Baseline, N = 20	Physiotherapy </=45 minutes, 5 days per week, 4 week, N = 20
Physical funtion - Fugl meyer assessment motor 0-66 Mean (SD)	22.8 (9.8)	32.7 (16.3)	22.8 (11.2)	31.6 (15.7)
Discontinuation no details provided on drop outs No of events	n = 0 ; % = 0	n = 1 ; % = 2.44	n = 0 ; % = 0	n = 1 ; % = 4.76

Physical funtion - Fugl meyer assessment motor - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better

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

4weekoutcomes-Discontinuation-NoOfEvents-Physiotherapy >45 minutes - 1 hour, 5 days per week-Physiotherapy </=45 minutes, 5 days per week-t4

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

4weekoutcomes-Physicalfuntion-Fuglmeyerassessmentmotor-MeanSD-Physiotherapy >45 minutes - 1 hour, 5 days per week-Physiotherapy </=45 minutes, 5 days per week-t4

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

Rodgers, 2019

Bibliographic Reference	Rodgers, H.; Bosomworth, H.; Krebs, H. I.; van Wijck, F.; Howel, D.; Wilson, N.; Aird, L.; Alvarado, N.; Andole, S.; Cohen, D. L.; Dawson, J.; Fernandez-Garcia, C.; Finch, T.; Ford, G. A.; Francis, R.; Hogg, S.; Hughes, N.; Price, C. I.; Ternent, L.; Turner, D. L.; Vale, L.; Wilkes, S.; Shaw, L.; Robot assisted training for the upper limb after stroke (RATULS): a multicentre randomised controlled trial; Lancet; 2019; vol. 394 (no. 10192); 51-62

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	The trial is registered with the ISRCTN registry, number ISRCTN69371850. RATULS
Study location	UK
Study setting	4 NHS stroke rehab units
Study dates	Between April 14, 2014, and April 30, 2018
Sources of funding	The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.
Inclusion criteria	Study participants were adults (age ≥18 years) with moderate or severe upper limb functional limitation (Action Research Arm Test [ARAT] score 0–39) as a result of first-ever stroke that had occurred between 1 week and 5 years before randomisation.
Exclusion criteria	Exclusion criteria were other notable impairment in the upper limb affected by stroke; other diagnosis that might interfere with rehabilitation or outcome assessments; previous use of the robotic gym system or other arm rehabilitation robot; participation in another upper limb rehabilitation trial; and previous enrolment in this study.

Recruitment / selection of participants	Participants were recruited from stroke units, outpatient clinics, day hospitals, community rehabilitation services, local stroke clubs, and primary care. All participants provided written informed consent.
Intervention(s)	Results from both treatment groups have been combined for the purposes of this review. Robot-assisted training and EULT programmes were delivered at the same frequency and duration: 45 min of face-to-face therapy, three times per week for 12 weeks. The same therapists and therapy assistants delivered both interventions at each centre. Robot-assisted training and EULT were delivered in addition to usual post-stroke care. The robot-assisted training programme integrated training with all three modules of the MIT-Manus robotic gym (shoulder–elbow module, wrist module, hand module integrated on to the shoulder–elbow module). The EULT programme was designed to reflect best practice using repetitive functional task practice to work towards participant-centred goals. Therapists recorded data on the content of EULT sessions; the MIT-Manus robotic gym recorded data on the robot-assisted training sessions content. Concomitant therapy: Participants in all groups received usual NHS care, which was provided by their local clinical service. The English national quality standard is that patients with stroke should be offered a minimum of 45 min of each appropriate therapy that is required, for a minimum of 5 days per week, at a level that enables the patient to meet their rehabilitation goals for as long as they are continuing to benefit from therapy and as long as they are able to tolerate it. Many stroke units achieve this target for physiotherapy and occupational therapy, but considerable variation exists in service provision after discharge. Participants in all three groups received an arm rehabilitation therapy log to record any upper limb rehabilitation received during the trial and any self-practice arm exercises done.

Population subgroups	Physiotherapists
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Moderate (or NIHSS 5-14)
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed

Subgroup 8: Professional providing care	Physiotherapists
Comparator	Participants assigned to usual care received usual NHS care, which was provided by their local clinical service. The English national quality standard is that patients with stroke should be offered a minimum of 45 min of each appropriate therapy that is required, for a minimum of 5 days per week, at a level that enables the patient to meet their rehabilitation goals for as long as they are continuing to benefit from therapy and as long as they are able to tolerate it. Many stroke units achieve this target for physiotherapy and occupational therapy, but considerable variation exists in service provision after discharge. Participants in all three groups received an arm rehabilitation therapy log to record any upper limb rehabilitation received during the trial and any self-practice arm exercises done.
Number of participants	770
Duration of follow-up	6 months
Indirectness	NR
Elements of the study relating to qualitative themes	robot assisted therapy use of expensive equipment meaningful activities

	Individual therapy Hospital care
Additional comments	Simple imputation was used in the calculation of the scales. Missing values contributing to a scale or subscale total were calculated using the median value of the respondent-specific completed responses on the rest of the scale or subscale to replace missing items, if no more than 20% of items were missing. The exception was the SIS, where we used the scale developers' rules (for a particular participant, if <50% of items are missing in a dimension then the mean of the non-missing items is used in the formula for the final score; final score=25 × [mean of non-missing items–1]). A cost-utility analysis was done to assess the incremental cost per QALY gained. The analysis took the perspective of the NHS and Personal Social Services.

Study arms

Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care) (N = 516)
Robot-assisted training and EULT programmes were delivered at the same frequency and duration: 45 min of face-to-face therapy, three times per week for 12 weeks. both intervention groups have been combined for the purpose of this review.

Physiotherapy >45 min - 1 hour, 5 days per week (N = 254)
Participants assigned to usual care received usual NHS care, which was provided by their local clinical service. The English national quality standard is that patients with stroke should be offered a minimum of 45 min of each appropriate therapy that is required, for a minimum of 5 days per week, at a level that enables the patient to meet their rehabilitation goals for as long as they are continuing to benefit from therapy and as long as they are able to tolerate it.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 770)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	**Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care) (N = 516)**	**Physiotherapy >45 min - 1 hour, 5 days per week (N = 254)**
% Female Nominal	39	40
Mean age (SD) Mean (SD)	59.65 (13.91)	62.5 (12.5)
Severity NIHSS	5.7 (3.2)	5.8 (3.2)

Characteristic	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care) (N = 516)	Physiotherapy >45 min - 1 hour, 5 days per week (N = 254)
Mean (SD)		
Time period since stroke days Mean (SD)	245.5 (63.88)	242 (62.15)

Outcomes

Study timepoints

- Baseline
- 3 month
- 6 month

3 and 6 month outcomes

Outcome	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), Baseline, N = 516	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), 3 month, N = 468	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), 6 month, N = 445	Physiotherapy >45 min - 1 hour, 5 days per week, Baseline, N = 244	Physiotherapy >45 min - 1 hour, 5 days per week, 3 month, N = 207	Physiotherapy >45 min - 1 hour, 5 days per week, 6 month, N = 190
EQ-5D-5L 0-1 Mean (SD)	0.36 (0.26)	0.47 (0.26)	0.48 (0.28)	0.37 (0.26)	0.42 (0.29)	0.46 (0.27)

Outcome	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), Baseline, N = 516	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), 3 month, N = 468	Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care), 6 month, N = 445	Physiotherapy >45 min - 1 hour, 5 days per week, Baseline, N = 244	Physiotherapy >45 min - 1 hour, 5 days per week, 3 month, N = 207	Physiotherapy >45 min - 1 hour, 5 days per week, 6 month, N = 190
Barthel Index 0-100 Mean (SD)	14.4 (3.9)	15.7 (3.4)	15.8 (3.5)	14.4 (3.9)	15.3 (3.8)	15.3 (3.7)
physical function - fugel meyer total score (treatment group - 3 months n = 466, 6 months n = 439. control group 3 months n= 202, 6 months n= 186) 0-120 Mean (SD)	68.95 (17.22)	77.2 (22.5)	78.8 (23.5)	68.9 (17.4)	74.2 (23.6)	77.9 (23.2)
Discontinuation due to adverse events intervention group - 42 withdrew, 4 died. control group - 40 withdrew No of events	n = 0 ; % = 0	n = 31 ; % = 6.62	n = 46 ; % = 9.83	n = 0 ; % = 0	n = 31 ; % = 12.7	n = 40 ; % = 16.39

EQ-5D-5L - Polarity - Higher values are better
Barthel Index - Polarity - Higher values are better
physical function - fugel meyer total score - Polarity - Higher values are better
Discontinuation due to adverse events - Polarity - Lower values are better

final values

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

3and6monthoutcomes-Discontinuationduetoadverseevents-NoOfEvents-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t3

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

3and6monthoutcomes-Discontinuationduetoadverseevents-NoOfEvents-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t6

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

3and6monthoutcomes-physicalfunction-fugelmeyertotalscore-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t3

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

3and6monthoutcomes-physicalfunction-fugelmeyertotalscore-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t6

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

3and6monthoutcomes-BarthelIndex-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t3

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

3and6monthoutcomes-BarthelIndex-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t6

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

3and6monthoutcomes-EQ-5D-5L-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t3

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

3and6monthoutcomes-EQ-5D-5L-MeanSD-Physiotherapy >1-2 hours, 5 days per week (30 mins intervention +45 min usual care)-Physiotherapy >45 min - 1 hour, 5 days per week-t6

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

Rose, 2022

Bibliographic Reference	Rose, M.L.; Nickels, L.; Copland, D.; Togher, L.; Godecke, E.; Meinzer, M.; Rai, T.; Cadilhac, D.A.; Kim, J.; Hurley, M.; Foster, A.; Carragher, M.; Wilcox, C.; Pierce, J.E.; Steel, G.; Results of the COMPARE trial of Constraint-induced or Multimodality Aphasia Therapy compared with usual care in chronic post-stroke aphasia; Journal of Neurology, Neurosurgery and Psychiatry; 2022; vol. 93 (no. 6); 573-581

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	ACTRN 2615000618550.
Study type	Randomised controlled trial (RCT)
Study location	Australia.
Study setting	Community based.
Study dates	15th July 2016 to 30th March 2021.
Sources of funding	Funded by the Australian National Health and Medical Research Council (#1083010). Additional funded by La Trobe University.
Inclusion criteria	Aged 18 years or older; living in the community; had chronic aphasia resulting from stroke of any kind (>6 months duration) confirmed by an aphasia quotient <93.8 on the Western Aphasia Battery-Revised Aphasia Quotient at the time of screening; fluent in English prior to stroke; independent in toileting or had a caregiver who could assist with toileting during therapy.

Exclusion criteria	Had a neurological condition other than a stroke; severe apraxia of speech or dysarthria (Apraxia Severity Rating Scale) uncorrected sensory loss preventing participation in group communication; a diagnosis of a self-reported untreated mental health condition preventing adherence to the study protocol.
Recruitment / selection of participants	Recruited through 19 hospital sites and via direct community advertising.
Intervention(s)	Speech and language therapy - >2-4 hours, 5 days a week N=146 Two groups combined: 3 hours of constraint-induced group therapy, 5 days a week for 2 weeks (n=71), 3 hours of multi-modality group therapy, 5 days a week for 2 weeks (n=75). Rest breaks of 15-30 minutes were provided between every 1 hour session. A 15 minute daily home practice communication task was prescribed, checked for completion the following day and logged. The tasks were provided in community settings. The sessions involved six different structured, protocolised communication activities including requesting items, clarifying requests, recalling items from memory and naming items. A prescribed set (easy, moderate, hard) of 80 coloured picture cards (48 nouns, 32 verbs) was utilised in therapy according to participant pretreatment picture naming accuracy. Therapists prescribed production targets ranging from single nouns/verbs to complex sentences. Therapist decisions to select targets and picture sets were guided by a detailed protocol. In the constraint group, people were not permitted to use paper and pencil or augmentative communication devices, focusing all activity on spoken communication. Visual barriers were placed between people to limit nonverbal communication attempts. In the multimodal communication groups, there were no barriers and multimodal communication and cues were utilised. Concomitant therapy: All people could undergo usual care throughout the trial. Usual care comprise of no direct intervention for some, and non-intense, individual, computerised or social/support group sessions for others. No specific amount of therapy was reported.
Intervention stratification - Type of therapist	Speech and language therapy
Population subgroups	No additional information.

Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Speech and Language Therapists

Comparator	Usual care N=70 Usual care only. Concomitant therapy: All people could undergo usual care throughout the trial. Usual care comprise of no direct intervention for some, and non-intense, individual, computerised or social/support group sessions for others. No specific amount of therapy was reported.
Number of participants	216
Duration of follow-up	2 weeks (post intervention) and then 12 additional weeks (14 weeks in total)
Indirectness	No additional information.
Elements of the study relating to qualitative themes	Person centred care: Intensity tailored to the individual - Splitting therapy by providing breaks between sessions People with communication difficulties Individual therapy (though lots of other options were available in the usual care arm) Variety in activities and choice Accessible therapy (completed in the community)
Additional comments	Intention-to-treat

Study arms

Speech and language therapy - >2-4 hours, 5 days a week (N = 146)
Two groups combined: 3 hours of constraint-induced group therapy, 5 days a week for 2 weeks (n=71), 3 hours of multi-modality group therapy, 5 days a week for 2 weeks (n=75). Rest breaks of 15-30 minutes were provided between every 1 hour session. A 15 minute daily home practice communication task was prescribed, checked for completion the following day and logged. The tasks were provided in community settings. The sessions involved six different structured, protocolised communication activities including requesting items, clarifying requests, recalling items from memory and naming items. A prescribed set (easy, moderate, hard) of 80 coloured picture cards (48 nouns, 32 verbs) was utilised in therapy according to participant pretreatment picture naming accuracy. Therapists prescribed production targets ranging from single nouns/verbs to complex sentences. Therapist decisions to select targets and picture sets were guided by a detailed protocol. In the constraint group, people were not permitted to use paper and pencil or augmentative communication devices, focusing all activity on spoken communication. Visual barriers were placed between people to limit nonverbal communication attempts. In the multimodal communication groups, there were no barriers and multimodal communication and cues were utilised. Concomitant therapy: All people could undergo usual care throughout the trial. Usual care comprise of no direct intervention for some, and non-intense, individual, computerised or social/support group sessions for others. No specific amount of therapy was reported.

Usual care (N = 70)
Usual care only. Concomitant therapy: All people could undergo usual care throughout the trial. Usual care comprise of no direct intervention for some, and non-intense, individual, computerised or social/support group sessions for others. No specific amount of therapy was reported.

Characteristics

Arm-level characteristics

Characteristic	Speech and language therapy - >2-4 hours, 5 days a week (N = 146)	Usual care (N = 70)
% Female Sample size	n = 47 ; % = 32	n = 22 ; % = 31
Mean age (SD) (years) Intervention reports the value for the constraint group. The value for the multimodality group is: 63.77 (21.02) years. IQR	19.79	14.10
Mean age (SD) (years) Intervention reports the value for the constraint group. The value for the multimodality group is: 63.77 (21.02) years. Median (IQR)	63.93 (NR to NR)	63.16 (NR to NR)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NR ; % = NR	n = NR ; % = NR
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Mild WAB-R-AQ (62.6-93.6) Sample size	n = 100 ; % = 69	n = 49 ; % = 70

Characteristic	Speech and language therapy - >2-4 hours, 5 days a week (N = 146)	Usual care (N = 70)
Moderate WAB-R-AQ (31.3-62.5) Sample size	n = 38 ; % = 26	n = 18 ; % = 26
Severe WAB-R-AQ (0-31.2) Sample size	n = 6 ; % = 4	n = 0 ; % = 0
Above cut-off (93.7-100) Sample size	n = 2 ; % = 1	n = 3 ; % = 4
Time period since stroke (years) The value in the intervention arm is for the constraint arm. The value for the multimodal arm is: 2.97 (3.81). IQR	4.22	2.87
Time period since stroke (years) The value in the intervention arm is for the constraint arm. The value for the multimodal arm is: 2.97 (3.81). Median (IQR)	2.41 (NR to NR)	2.58 (NR to NR)
Type of communication difficulty Sample size	n = NA ; % = NA	n = NA ; % = NA
Anomic Sample size	n = 61 ; % = 42	n = 30 ; % = 43
Broca's Sample size	n = 38 ; % = 26	n = 15 ; % = 21

Characteristic	Speech and language therapy - >2-4 hours, 5 days a week (N = 146)	Usual care (N = 70)
Conduction Sample size	n = 29 ; % = 20	n = 11 ; % = 16
Wernicke's Sample size	n = 10 ; % = 7	n = 9 ; % = 13
Global Sample size	n = 2 ; % = 1	n = 0 ; % = 0
Transcortical motor Sample size	n = 1 ; % = 1	n = 2 ; % = 3
Transcortical sensory Sample size	n = 1 ; % = 1	n = 0 ; % = 0
Unclassifiable Sample size	n = 4 ; % = 3	n = 3 ; % = 4

Outcomes

Study timepoints

- Baseline
- 14 week (<6 months)

Continuous outcomes

Outcome	Speech and language therapy - >2-4 hours, 5 days a week, Baseline, N = 146	Speech and language therapy - >2-4 hours, 5 days a week, 14 week, N = 133	Usual care, Baseline, N = 75	Usual care, 14 week, N = 67
Person/participant health-related quality of life (SAQOL-39g) Scale range: 1-5. Change scores. Mean (SD)	3.69 (0.69)	0.03 (0.37)	3.69 (0.56)	0.01 (0.36)
Communication - Overall language ability (Western Aphasia Battery) Scale range: 0-100. Change scores. Mean (SD)	69.97 (18.4)	1.33 (5.49)	72.69 (18.13)	3.07 (6.58)
Communication - Impairment specific measures (naming) (COMPARE naming battery 100 untreated items) (items) Scale range: 0-100. Change scores. Mean (SD)	61.01 (29.64)	3.35 (8.91)	67.74 (25.73)	2.97 (6.76)
Functional communication (Communication Effectiveness Index) Scale range: 0-100. Change scores. Mean (SD)	54.33 (17.66)	3.24 (15.85)	59.28 (16.82)	0.2 (13.31)

Person/participant health-related quality of life (SAQOL-39g) - Polarity - Higher values are better
Communication - Overall language ability (Western Aphasia Battery) - Polarity - Higher values are better
Communication - Impairment specific measures (naming) (COMPARE naming battery 100 untreated items) - Polarity - Higher values are better
Functional communication (Communication Effectiveness Index) - Polarity - Higher values are better

Dichotomous outcomes

Outcome	Speech and language therapy - >2-4 hours, 5 days a week, Baseline, N = 146	Speech and language therapy - >2-4 hours, 5 days a week, 14 week, N = 146	Usual care, Baseline, N = 75	Usual care, 14 week, N = 75
Discontinuation from the study Intervention: 3 discontinued prior to commencing, 3 due to COVID-19, 7 lost to follow up. Control: 9 dissatisfied with allocation, 2 lost to follow up. No of events	n = NA ; % = NA	n = 17 ; % = 12	n = NA ; % = NA	n = 11 ; % = 15

Discontinuation from the study - Polarity - Lower values are better

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

Continuousoutcomes-Person/participanthealth-relatedqualityoflife(SAQOL-39g)-MeanSD-Speech and language therapy - >2-4 hours, 5 days a week-Usual care-t14

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

Continuousoutcomes-Communication-Overalllanguageability(WesternAphasiaBattery)-MeanSD-Speech and language therapy - >2-4 hours, 5 days a week-Usual care-t14

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

Continuousoutcomes-Communication-Impairmentspecificmeasures(naming)(COMPAREnamingbattery100untreateditems)-MeanSD-Speech and language therapy - >2-4 hours, 5 days a week-Usual care-t14

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

Continuousoutcomes-Functionalcommunication(CommunicationEffectivenessIndex)-MeanSD-Speech and language therapy - >2-4 hours, 5 days a week-Usual care-t14

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

Dichotomousoutcomes-Discontinuationfromthestudy-NoOfEvents-Speech and language therapy - >2-4 hours, 5 days a week-Usual care-t14

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

Ross, 2009

Bibliographic Reference	Ross, L. F.; Harvey, L. A.; Lannin, N. A.; Do people with acquired brain impairment benefit from additional therapy specifically directed at the hand? A randomized controlled trial; Clinical Rehabilitation; 2009; vol. 23 (no. 6); 492-503

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	(ACTRN12606000173594)

Study location	Australia
Study setting	stroke rehabilitation hospital - inpatients and outpatients
Study dates	NR
Sources of funding	This research was conducted with financial support from a Queensland Health Allied Health Research Scheme award. No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit upon the author(s) or upon any organization with which the author(s) is/are associated.
Inclusion criteria	Inpatients and outpatients from a rehabilitation hospital were screened for inclusion. The inclusion criteria for participation in the study were an acquired brain injury within the past five years, over 18 years of age and notable hand impairment (i.e. a score of less than 80% on the Action Research Arm Test). The inclusion criteria did not specify a minimal level of hand function.
Exclusion criteria	Participants were excluded if they had a coexisting injury or disease affecting hand function and were unable to complete six weeks of training (i.e. for geographical, medical or psycho-social reasons). Patients with cognitive or physical problems precluding cooperation with the programme were also excluded.
Recruitment / selection of participants	Inpatients and outpatients from a rehabilitation hospital were screened for inclusion.
Intervention(s)	The experimental group (n20) received an additional one-hour session of task-specific motor training for the hand five times a week over a six-week period. The training was administered on a one-to-one basis. Participants in the intensive hand-training group received five 1-hour sessions with a therapist for six weeks. All hand training was based on the principles of task-specific motor training and included repetitive practice of tasks which were individualized to the functional goals of each patient. The goals were documented and the exercises were devised to meet each goal. In addition, targeted feedback and environmental cues were provided at all times to maximize successful performance. Training was closely supervised on a one-to-one basis by one of a small number of experienced therapists. The amount of actual practice performed in each session was carefully monitored. For this purpose a stopwatch was used to record the time spent performing hand activities. The aim was to achieve at least 45 minutes of repetitious practice in each session. This did not include time spent setting up, talking, recording progress or articulating goals. In addition, the number of hand movements per session was counted.

	Concomitant therapy: Both groups continued to receive usual arm care. This was probably more than routinely provided in most clinical settings. It consisted of half an hour of motor training for the shoulder and elbow five times a week. This training predominantly consisted of practising reaching activities but also consisted of practising specific shoulder and elbow movements. A cup or splint was strapped to participants' hands to standardize inadvertent hand training. Attention was directed at ensuring participants received at least 20 minutes of actual training. Usual care for both groups also consisted of strategies such as slings, wheelchair arm troughs and positioning programmes. If appropriate, participants received electrical stimulation to prevent shoulder subluxation as well as education, advice and retraining in activities of daily living (e.g. showering and toileting).
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Mixed
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control group continued to receive usual arm care. This was probably more than routinely provided in most clinical settings. It consisted of half an hour of motor training for the shoulder and elbow five times a week. This training predominantly consisted of practising reaching activities but also consisted of practising specific shoulder and elbow movements. A cup or splint was strapped to participants' hands to standardize inadvertent hand training. Attention was directed at ensuring participants received at least 20 minutes of actual training. Usual care for both groups also consisted of strategies such as slings, wheelchair arm troughs and positioning programmes. If appropriate, participants received electrical stimulation to prevent shoulder subluxation as well as education, advice and retraining in activities of daily living (e.g. showering and toileting). In addition, participants in the control group had similar hand therapy as participants in the experimental group but for only 10 minutes, three times a week for 6 weeks.
Number of participants	39
Duration of follow-up	6 week
Indirectness	10% of patients had acquired brain injury
Elements of the study relating to qualitative themes	intensity/programme tailored to the individual

	Supervision - excellent compliance with supervision Individual therapy Hospital care
Additional comments	NR

Study arms

Physiotherapy >1-2 hours, 5 days per week (N = 20)
The experimental group (n20) received an additional one-hour session of task-specific motor training for the hand five times a week over a six-week period. The training was administered on a one-to-one basis. Both groups continued to receive usual arm care. This was probably more than routinely provided in most clinical settings. It consisted of half an hour of motor training for the shoulder and elbow five times a week. This training predominantly consisted of practising reaching activities but also consisted of practising specific shoulder and elbow movements. A cup or splint was strapped to participants' hands to standardize inadvertent hand training. Attention was directed at ensuring participants received at least 20 minutes of actual training. Usual care for both groups also consisted of strategies such as slings, wheelchair arm troughs and positioning programmes. If appropriate, participants received electrical stimulation to prevent shoulder subluxation as well as education, advice and retraining in activities of daily living (e.g. showering and toileting).

Physiotherapy >45 minutes - 1 hour, 5 days per week (N = 20)
Both groups continued to receive usual arm care. This was probably more than routinely provided in most clinical settings. It consisted of half an hour of motor training for the shoulder and elbow five times a week. This training predominantly consisted of practising reaching activities but also consisted of practising specific shoulder and elbow movements. A cup or splint was strapped to

participants' hands to standardize inadvertent hand training. Attention was directed at ensuring participants received at least 20 minutes of actual training. Usual care for both groups also consisted of strategies such as slings, wheelchair arm troughs and positioning programmes. If appropriate, participants received electrical stimulation to prevent shoulder subluxation as well as education, advice and retraining in activities of daily living (e.g. showering and toileting). In addition, participants in the control group had similar hand therapy as participants in the experimental group but for only 10 minutes, three times a week for 6 weeks.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 40)**
Ethnicity Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	**Physiotherapy >1-2 hours, 5 days per week (N = 20)**	**Physiotherapy >45 minutes - 1 hour, 5 days per week (N = 20)**
% Female Nominal	50	42

Characteristic	Physiotherapy >1-2 hours, 5 days per week (N = 20)	Physiotherapy >45 minutes - 1 hour, 5 days per week (N = 20)
Mean age (SD) Mean (SD)	60 (21)	59 (19)
Comorbidities Nominal	NR	NR
brain injury Nominal	15	5
Time period since stroke Mean (SD)	NR (*empty data*)	NR (*empty data*)
Time period since stroke Median (IQR)	2.3 (0.7 to 4.4)	0.7 (0.3 to 3)

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	Physiotherapy >1-2 hours, 5 days per week, Baseline, N = 20	Physiotherapy >1-2 hours, 5 days per week, 6 week, N = 18	Physiotherapy >45 minutes - 1 hour, 5 days per week, Baseline, N = 20	Physiotherapy >45 minutes - 1 hour, 5 days per week, 6 week, N = 17
activities of daily living - Canadian Occupational Performance Measure - performance score 1-10 Mean (SD)	2.7 (1.7)	5.4 (1.9)	3 (1.7)	5.4 (2.9)
physical function - ARAT (n = 20 baseline and n = 20 6 weeks in exp group) 0-57 Mean (SD)	10 (15)	21 (23)	10 (14)	24 (26)
Discontinuation due to adverse events control = 1 died, 1 drop out due to medical complications, 1 excluded due to change in diagnosis No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 3 ; % = 15

activities of daily living - Canadian Occupational Performance Measure - performance score - Polarity - Lower values are better
physical function - ARAT - Polarity - Higher values are better
Discontinuation due to adverse events - Polarity - Lower values are better
final values

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

6weekoutcomes-Discontinuationduetoadverseevents-NoOfEvents-Physiotherapy >1-2 hours, 5 days per week-Physiotherapy >45 minutes - 1 hour, 5 days per week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(includes 10% of patients with acquired brain injury)*

6weekoutcomes-physicalfunction-ARAT-MeanSD-Physiotherapy >1-2 hours, 5 days per week-Physiotherapy >45 minutes - 1 hour, 5 days per week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(includes 10% of patients with acquired brain injury)*

6weekoutcomes-activitiesofdailyliving-CanadianOccupationalPerformanceMeasure-performancescore-MeanSD-Physiotherapy >1-2 hours, 5 days per week-Physiotherapy >45 minutes - 1 hour, 5 days per week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable *(includes 10% of patients with acquired brain injury)*

Seo, 2012

Bibliographic Reference	Seo, Dk; Kwon, Os; Kim, Jh; Lee, Dy; The effect of trunk stabilization exercise on the thickness of the deep abdominal muscles and balance in patients with chronic stroke; Journal of Physical Therapy Science; 2012; vol. 24 (no. 2); 181-5.

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	NR
Study location	Republic of Korea
Study setting	outpatients rehabilitation
Study dates	NR
Sources of funding	NR
Inclusion criteria	inclusion criteria consisted of; agreement to participate in the study, within 6 months from the onset of stroke, no complaints of chronic back pain or current back pain and the ability to follow directions given by therapists (MMSE-k over 24 points).

Exclusion criteria	NR
Recruitment / selection of participants	The subjects of the study were 40 patients with chronic stroke admitted to H hospital, Daejon city, were selected using specific criteria.
Intervention(s)	The experimental group performed trunk stabilisation exercises using sonographic visual feedback for 30 minutes. Patients also received conservative physiotherapy which consisted of posture control training, walking training, and muscle strength exercises, and was conducted to maximised ADLs and to develop function. the intervention was conducted 5 times a week, for 5 weeks for a total of 25 times. patients were educated about truck stabilisation exercises. Exercises were conducted without real-time ultrasound feedback during the second to fifth week for 4 weeks. Concomitant therapy: Both received routine physical therapy for 30 min, 5 times a week for 5 weeks.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control group received conservative physiotherapy which consisted of posture control training, walking training, and muscle strength exercises, and was conducted to maximised ADLs and to develop function. Patients received routine physical therapy for 30 min, 5 times a week for 5 weeks.
Number of participants	12
Duration of follow-up	5 weeks
Indirectness	NR

Elements of the study relating to qualitative themes	feedback - use of biofeedback from the US machine Individual therapy Hospital care Use of expensive equipment - Ultrasound machine
Additional comments	NR

Study arms

physiotherapy >1-2 hours, 5 times per week (N = 6)
The 2 groups received routine physical therapy for 30 min, 5 times a week for 5 weeks. In addition, EG performed trunk stabilization exercises with visual feedback, using ultrasonic imaging, for 30 min. Total 25 sessions.

physiotherapy </= 45 mins, 5 days per week (N = 6)
Routine physical therapy for 30 min, 5 times a week for 5 weeks

Characteristics

Study-level characteristics

Characteristic	**Study (N = 12)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	**physiotherapy >1-2 hours, 5 times per week (N = 6)**	**physiotherapy </= 45 mins, 5 days per week (N = 6)**
% Female Nominal	17	17
Mean age (SD) Mean (SD)	59.8 (12.8)	57.83 (10.7)
Time period since stroke (Months) Mean (SD)	7.33 (4.63)	16.5 (15.44)

Outcomes

Study timepoints

- Baseline
- 5 week

5 week outcomes

Outcome	physiotherapy >1-2 hours, 5 times per week, Baseline, N = 9	physiotherapy >1-2 hours, 5 times per week, 5 week, N = 6	physiotherapy </= 45 mins, 5 days per week, Baseline, N = 8	physiotherapy </= 45 mins, 5 days per week, 5 week, N = 6
physical function- lower limb - functional reach test (cm) Mean (SD)	9.49 (3.66)	15.34 (4.63)	8.63 (6.07)	10.44 (6.77)
(outcome not in protocol) not upper or lower limb so can be left out) functional outcome - postural assessment scale 0-36 Mean (SD)	27.5 (4.59)	32.67 (2.8)	31 (2.28)	32.5 (1.87)
Discontinuation experimental group - 3 did not complete the study, control group - 1 did not complete study and 1 sustained an above knee fracture No of events	n = 0 ; % = 0	n = 3 ; % = 33	n = 0 ; % = 0	n = 2 ; % = 25

physical function- lower limb - functional reach test - Polarity - Higher values are better
(outcome not in protocol) not upper or lower limb so can be left out) functional outcome - postural assessment scale - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

5weekoutcomes-Discontinuation-NoOfEvents-physiotherapy >1-2 hours, 5 times per week-physiotherapy </= 45 mins, 5 days per week-t5

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

5weekoutcomes-functionaloutcome-posturalassessmentscale-MeanSD-physiotherapy >1-2 hours, 5 times per week-physiotherapy </= 45 mins, 5 days per week-t5

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

5weekoutcomes-physicalfunction-functionalreachtest-MeanSD-physiotherapy >1-2 hours, 5 times per week-physiotherapy </= 45 mins, 5 days per week-t5

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

Sin, 2013

Bibliographic Reference	Sin, H.; Lee, G.; Additional virtual reality training using Xbox Kinect in stroke survivors with hemiplegia; American Journal of Physical Medicine & Rehabilitation; 2013; vol. 92 (no. 10); 871-80

Study details

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

Study type	Randomised controlled trial (RCT)
Study location	Republic of Korea.
Study setting	Inpatients from a rehabilitation hospital.
Study dates	No additional information.
Sources of funding	Supported by Kyungnam University Research Fund, 2013.
Inclusion criteria	More than 6 months since stroke; no problems with auditory of visual functioning; active range of motion of the shoulder, the elbow, the wrist and the fingers is more than 10 degrees; ability to walk more than 10m independently; not taking any medication that could influence balance or gait; no severe cognitive disorders (Mini-Mental State Examination score of >16/30).
Exclusion criteria	Uncontrolled blood pressure or angina; history of seizure; any intervention other than conventional therapy; refusal to use a video game.
Recruitment / selection of participants	No additional information.
Intervention(s)	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week N=20 VR Training Using Xbox Kinect (Xbox 360, Microsoft, United States). Using an infrared camera sensor (allowing perception of movement without a controller). Tasks were given and when these were not performed properly, visual and auditory sensory feedback are provided. For training, the screen and beam projector were set up in an independent environment that was not influenced by external factors. The infrared camera sensor was positioned around 1.5-2m away from the person as they sat or stood. The person was allowed to undertake their training in a dedicated space to minimize disturbances. For training, programs such as Boxing and Bowling in the Kinect sports pack and Rally Ball, 20,000 Leaks, and Space Pop in the Kinect adventure pack, all of which required the use of the upper extremities, were selected. Two programs that fitted the user's ability and interest from the packs were played for 15 minutes each, for a total of 30 minutes per session (three times a week for 6 weeks). People experienced all programs over the 6 weeks. The programs required active movements of the upper extremity, and people usually performed the active movements of shoulder flexion, extension, abduction, adduction, external rotation and internal rotation, along with elbow flexion and extension, forearm

	supination and pronation, and wrist flexion and extension on the affected side. Time for practice was allowed before the person engaged in the games. Concomitant therapy: All people underwent conventional occupational therapy for 30 minutes three times a week for 6 weeks. Conventional occupational therapy was individualised on the basis of the goals set by the therapist, the patient's focus on upper extremity and hand function and activities of daily living. The protocol included passive range of motion and/or active range of motion exercises; muscle strengthening and therapeutic stretching of the shoulder, the elbow , the wrist and the fingers. Each exercise lasted 5 minutes. After these, activities of daily living, including eating, grooming, dressing, toileting and transfer were performed for 15 minutes. The training was selected dependent on the person's needs.
Intervention stratification - Type of therapist	Occupational therapy
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only
Subgroup 8: Professional providing care	Occupational Therapists
Comparator	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week N=20 Conventional occupational therapy only. Concomitant therapy: All people underwent conventional occupational therapy for 30 minutes three times a week for 6 weeks. Conventional occupational therapy was individualised on the basis of the goals set by the therapist, the patient's focus on upper extremity and hand function and activities of daily living. The protocol included passive range of motion and/or active range of motion exercises; muscle strengthening and therapeutic stretching of the shoulder, the elbow , the wrist and the fingers. Each exercise lasted 5 minutes. After these, activities of daily living, including eating, grooming, dressing, toileting and transfer were performed for 15 minutes. The training was selected dependent on the person's needs.
Number of participants	40
Duration of follow-up	6 weeks

Indirectness	No additional information.
Elements of the study relating to qualitative themes	Intervention factors: Individual therapy Telerehabilitation, assisted technology and computer-based tools Intervention themes: Variety in activities and choice Provision of feedback (by the technology) Environmental factors: Hospital care
Additional comments	No additional information.

Study arms

Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week (N = 20)
VR Training Using Xbox Kinect (Xbox 360, Microsoft, United States). Using an infrared camera sensor (allowing perception of movement without a controller). Tasks were given and when these were not performed properly, visual and auditory sensory feedback are provided. For training, the screen and beam projector were set up in an independent environment that was not influenced by external factors. The infrared camera sensor was positioned around 1.5-2m away from the person as they sat or stood. The person was allowed to undertake their training in a dedicated space to minimize disturbances. For training, programs such as Boxing and Bowling in the Kinect sports pack and Rally Ball, 20,000 Leaks, and Space Pop in the Kinect adventure pack, all of which required the use of the upper extremities, were selected. Two programs that fitted the user's ability and interest from the packs were played for 15 minutes each, for a total of 30 minutes per session (three times a week for 6 weeks). People experienced all programs over the 6 weeks. The programs required active movements of the upper extremity, and people usually performed the active movements of shoulder flexion, extension, abduction, adduction, external rotation and internal rotation, along with elbow flexion and extension, forearm supination and pronation, and wrist flexion and extension on the affected side. Time for practice was allowed before the person engaged in the games. Concomitant therapy: All people underwent conventional occupational therapy for 30 minutes three times a week for 6 weeks. Conventional occupational therapy was individualised on the basis of the goals set by the therapist, the patient's focus on upper extremity and hand function and activities of daily living. The protocol included passive range of motion and/or active range of motion exercises; muscle strengthening and therapeutic stretching of the shoulder, the elbow , the wrist and the fingers. Each exercise lasted 5 minutes. After these, activities of daily living, including eating, grooming, dressing, toileting and transfer were performed for 15 minutes. The training was selected dependent on the person's needs.

Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week (N = 20)
Conventional occupational therapy only. Concomitant therapy: All people underwent conventional occupational therapy for 30 minutes three times a week for 6 weeks. Conventional occupational therapy was individualised on the basis of the goals set by the therapist, the patient's focus on upper extremity and hand function and activities of daily living. The protocol included passive range of motion and/or active range of motion exercises; muscle strengthening and therapeutic stretching of the shoulder, the elbow , the wrist and the fingers. Each exercise lasted 5 minutes. After these, activities of daily living, including eating, grooming, dressing, toileting and transfer were performed for 15 minutes. The training was selected dependent on the person's needs.

Characteristics

Arm-level characteristics

Characteristic	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week (N = 20)	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week (N = 20)
% Female Sample size	n = 8 ; % = 44	n = 7 ; % = 41
Mean age (SD) (years) Mean (SD)	71.78 (9.42)	75.59 (5.55)
Ethnicity Sample size	n = NR ; % = NR	n = NR ; % = NR
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA
Hypertension Sample size	n = 11 ; % = 61.11	n = 12 ; % = 70.59
Dyslipidaemia Sample size	n = 3 ; % = 16.67	n = 2 ; % = 11.76
Diabetes mellitus Sample size	n = 5 ; % = 27.78	n = 2 ; % = 11.76

Characteristic	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week (N = 20)	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week (N = 20)
Severity Severity of upper extremity motor deficit on Fugl Meyer score Mean (SD)	26.06 (15.81)	32.29 (20.43)
Time period since stroke (Months) Mean (SD)	7.22 (1.21)	8.47 (2.98)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Number of participants in the baseline characteristics were 18 and 17 respectively.

Outcomes

Study timepoints

- Baseline
- 6 week (<6 months)

Continuous outcome

Outcome	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week, Baseline, N = 18	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week, 6 week, N = 18	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week, Baseline, N = 17	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week, 6 week, N = 17
Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) Scale range: 0-66. Change scores. Mean (SD)	26.06 (15.81)	10.89 (6.31)	32.29 (20.43)	6.53 (2.6)

Physical function - upper limb (Fugl Meyer Assessment Upper Extremity) - Polarity - Higher values are better

Dichotomous outcome

Outcome	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week, Baseline, N = 20	Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week, 6 week, N = 20	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week, Baseline, N = 20	Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week, 6 week, N = 20
Discontinuation from study Intervention: 2 due to discharge, unrelated health problems. Control: 3 discharged. No of events	n = NA ; % = NA	n = 2 ; % = 10	n = NA ; % = NA	n = 3 ; % = 15

Discontinuation from study - Polarity - Lower values are better

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

Continuousoutcome-Physicalfunction-upperlimb(FuglMeyerAssessmentUpperExtremity)-MeanSD-Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week-Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week-t6

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

Dichotomousoutcome-Discontinuationfromstudy-NoOfEvents-Occupational therapy (no communication difficulties) - >45 minutes to 1 hour, <5 days a week-Occupational therapy (no communication difficulties) - ≤45 minutes, <5 days a week-t6

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

Sivenius, 1985

Bibliographic Reference	Sivenius, J.; Pyorala, K.; Heinonen, O. P.; Salonen, J. T.; Riekkinen, P.; The significance of intensity of rehabilitation of stroke--a controlled trial; Stroke; 1985; vol. 16 (no. 6); 928-31

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Department of Neurology at the University of Kuopio, Finland
Study setting	inpatients rehabilitation
Study dates	October 1st, 1978 until May 31st, 1980.
Sources of funding	NR
Inclusion criteria	The Department of Neurology at the University of Kuopio started a stroke register for the Kuopio area in east central Finland on October 1st, 1978, and it operated until May 31st, 1980. During that time period 373 stroke patients were found. After the stroke, all patients were candidates of the rehabilitation study.
Exclusion criteria	At one week the following criteria were used in excluding patients from this study: (1) Patient had SAH. (2) Patient did not have hemiparesis or it was very mild, patient did not need any help from others. (3) Prior to the stroke, the patient was already bed- ridden or dependent on others. (4) Because of a previous stroke, the disability after this new stroke was impossible to measure. (5) Malignant disease, because of which the benefit of rehabilitation would be short. Malignant disease was defined as "moribund" patients with advanced cancer or severe organic insufficiency (heart, kidney, liver). (6)

	Previous psychiatric disease, which would not allow effective rehabilitation. (7) The patient was unconscious (in coma or semi- coma). (8) The patient had not been seen by the study physician during the first week after the onset of the stroke
Recruitment / selection of participants	The Department of Neurology at the University of Kuopio started a stroke register for the Kuopio area in east central Finland on October 1st, 1978, and it operated until May 31st, 1980. During that time period 373 stroke patients were found. After the stroke, all patients were candidates of the rehabilitation study.
Intervention(s)	Intensive treatment - The patients in IT were also initially treated in medical wards of the local University Hospital. After this initial period the majority of patients was admitted to Vaajasalo Hospital. This hospital is a former epilepsy hospital which is now a part of the regional neurological health care organization. Its one department was redesigned into a rehabilitation unit with the purpose especially to treat stroke patients. The rest of patients in IT were treated in neurological wards of the University Hospital. The principle was that physiotherapy should be given as long as functional recovery was taking place or the patient could perform independently at home. The amount of therapy was measured as the number of sessions of therapy given by physical, occupational or speech therapist. Usually one physiotherapy session lasted half an hour. When a patient in IT was in the medical ward of University Hospital, she/he was treated by a physiotherapist twice a day. Concomitant therapy: none reported
Population subgroups	MDT
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Normal treatment - The patients in NT received the normal physical therapy in the conventional medical wards, the duration and amount of which was determined by the internists. The patients were discharged from these departments to their homes or, if it was not possible, to old age homes or chronic care departments of community hospitals, where some of them were able to obtain physiotherapy. The guiding principle was, however, that no patient's therapy was worsened as a result of the study.
Number of participants	95
Duration of follow-up	3 and 12 months
Indirectness	NR

Elements of the study relating to qualitative themes	intensity tailored to the individual - two shorter sessions per day hospital based rehabilitation individual therapy
Additional comments	NR

Study arms

multidisciplinary >1-2 hours, 5 days per week (N = 50)
The patients in IT were also initially treated in medical wards of the local University Hospital. After this initial period the majority of patients was admitted to Vaajasalo Hospital. This hospital is a former epilepsy hospital which is now a part of the regional neurological health care organization. Its one department was redesigned into a rehabilitation unit with the purpose especially to treat stroke patients. The rest of patients in IT were treated in neurological wards of the University Hospital. The principle was that physiotherapy should be given as long as functional recovery was taking place or the patient could perform independently at home. The amount of therapy was measured as the number of sessions of therapy given by physical, occupational or speech therapist. Usually one physiotherapy session lasted half an hour. When a patient in IT was in the medical ward of University Hospital, she/he was treated by a physiotherapist twice a day. There were no significant difference between groups after 6 months for the amount of therapy provided

multidisciplinary >45 mins - 1 hour, 5 days per week (N = 45)
The patients in NT received the normal physical therapy in the conventional medical wards, the duration and amount of which was determined by the therapists. The patients were discharged from these departments to their homes or, if it was not possible, to old age homes or chronic care departments of community hospitals, where some of them were able to obtain physiotherapy. The guiding

principle was, however, that no patient's therapy was worsened as a result of the study. There were no significant difference between groups after 6 months for the amount of therapy provided.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 95)**
Mean age (SD) Nominal	NR
Ethnicity Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	**multidisciplinary >1-2 hours, 5 days per week (N = 50)**	**multidisciplinary >45 mins - 1 hour, 5 days per week (N = 45)**
% Female Nominal	64	60
Comorbidities Nominal	NR	NR

Characteristic	multidisciplinary >1-2 hours, 5 days per week (N = 50)	multidisciplinary >45 mins - 1 hour, 5 days per week (N = 45)
Diabetes % Nominal	14	18
previous stroke % Nominal	12	24
Myocardial infarction Nominal	26	24
Angina Pectoris Nominal	34	53
cardiac failure Nominal	50	60
hypertonia % Nominal	40	47

Outcomes

Study timepoints

- Baseline

- 3 month
- 12 month

3 month outcomes

Outcome	multidisciplinary >1-2 hours, 5 days per week, Baseline, N = 50	multidisciplinary >1-2 hours, 5 days per week, 3 month, N = 50	multidisciplinary >1-2 hours, 5 days per week, 12 month, N = 50	multidisciplinary >45 mins - 1 hour, 5 days per week, Baseline, N = 45	multidisciplinary >45 mins - 1 hour, 5 days per week, 3 month, N = 45	multidisciplinary >45 mins - 1 hour, 5 days per week, 12 month, N = 45
ADL and ambulation scale developed by Lehmann et al - 0-27. At 3 months: N intervention = 41, N control = 33. At 12 months: N intervention = 42, N control = 35. Mean (SE)	NR (NR)	21 (1.3)	21.1 (1.3)	NR (NR)	16.3 (1.7)	18.4 (1.6)
Discontinuation Reasons for data not available not provided No of events	n = NA ; % = NA	n = 0 ; % = 0	n = 8 ; % = 16	n = NA ; % = NA	n = 2 ; % = 4.4	n = 10 ; % = 22.2
physical function-Katz and Ford NEuromuscular disability no scale. At 3	NR (NR)	26.4 (2.5)	26 (2.9)	NR (NR)	20.2 (2.2)	21.1 (2.3)

Outcome	multidisciplinary >1-2 hours, 5 days per week, Baseline, N = 50	multidisciplinary >1-2 hours, 5 days per week, 3 month, N = 50	multidisciplinary >1-2 hours, 5 days per week, 12 month, N = 50	multidisciplinary >45 mins - 1 hour, 5 days per week, Baseline, N = 45	multidisciplinary >45 mins - 1 hour, 5 days per week, 3 month, N = 45	multidisciplinary >45 mins - 1 hour, 5 days per week, 12 month, N = 45
months: N intervention = 38, N control = 32. At 12 months: N intervention = 40, N control = 35. Mean (SE)						

ADL and ambulation - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
physical function- Katz and Ford NEuromuscular disability - Polarity - Higher values are better
final values

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

3monthoutcomes-physicalfunction-KatzandFordNEuromusculardisability-MeanSE-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable *(only extracted outcomes at 3 months as there were no significant difference between groups after 6 months for the amount of therapy provided)*

3monthoutcomes-ADLandambulation-MeanSE-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable *(There were no significant difference between groups after 6 months for the amount of therapy provided)*

3monthoutcomes-Discontinuation-NoOfEvents-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t3

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

3monthoutcomes-ADLandambulation-MeanSE-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t12

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable *(There were no significant difference between groups after 6 months for the amount of therapy provided)*

3monthoutcomes-Discontinuation-NoOfEvents-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable *(There were no significant difference between groups after 6 months for the amount of therapy provided)*

3monthoutcomes-physicalfunction-KatzandFordNEuromusculardisability-MeanSE-multidisciplinary >1-2 hours, 5 days per week-multidisciplinary >45 mins - 1 hour, 5 days per week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable *(only extracted outcomes at 3 months as there were no significant difference between groups after 6 months for the amount of therapy provided)*

Smith, 1981

Bibliographic Reference	Smith, D. S.; Goldenberg, E.; Ashburn, A.; Kinsella, G.; Sheikh, K.; Brennan, P. J.; Meade, T. W.; Zutshi, D. W.; Perry, J. D.; Reeback, J. S.; Remedial therapy after stroke: a randomised controlled trial; British Medical Journal Clinical Research Ed.; 1981; vol. 282 (no. 6263); 517-20

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	UK
Study setting	Northwick Park, a district general hospital - outpatient rehabilitation
Study dates	October 1972 to September 1978
Sources of funding	NR

Inclusion criteria	The main criterion for entry was that the patient should be able to manage the most intensive of the three regimens, even if they were eventually allocated to one of the other regimens.
Exclusion criteria	The main criterion for entry was that the patient should be able to manage the most intensive of the three regimens, even if they were eventually allocated to one of the other regimens. A further 329 patients (30%) were excluded by this criterion: most of these were elderly patients, predominantly women, who were either too old or too frail for intensive rehabilitation or had other serious diseases. Forty-three patients lived outside the district and were excluded. Twenty-two patients did not enter the trial for other reasons; none of these included refusal to participate.
Recruitment / selection of participants	All 1094 patients with a recent confirmed stroke who were admitted to Northwick Park Hospital from October 1972 to September 1978 were considered for the trial. Of these, 364 (33%) died while in hospital and 215 patients (20%) made a full recovery while in hospital, in terms not only of day-to-day activities but also of limb function and speech. The remaining 515 patients were considered for the trial.
Intervention(s)	Intensive attendance in the rehabilitation department four whole days a week. Concomitant therapy: Patients in both groups received physiotherapy and occupational therapy in groups and individually for up to six months (except for four patients in group 1 who made a full recovery earlier), and time spent in therapy was recorded. patients with speech difficulties also received speech therapy as required.
Population subgroups	MDT
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated	Not stated/unclear

by category or as measured by NIHSS scale)	
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Conventional-attendance three half days a week. Concomitant therapy: Patients in both groups received physiotherapy and occupational therapy in groups and individually for up to six months (except for five in this group who made a full recovery earlier), and time spent in therapy was recorded. Patients with speech difficulties also received speech therapy.
Number of participants	89

Duration of follow-up	3 and 12 months
Indirectness	NR
Elements of the study relating to qualitative themes	individual therapy and group therapy hospital based
Additional comments	NR

Study arms

MDT rehabilitation >1-2 hours, 5 days per week (N = 46)
Intensive attendance in the rehabilitation department with treatment by OTs and physiotherapists four whole days a week. total therapy = 124.1 hours delivered for approximately 6 months.

MDT rehabilitation </=45 minutes, 5 days per week (N = 43)
conventional attendance three half days a week for approx 6 months. total therapy = 66 hours delivered over approximately 6 months. extracted 2 groups and left out the no treatment group as they did not receive any rehabilitation.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 89)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	**MDT rehabilitation >1-2 hours, 5 days per week (N = 46)**	**MDT rehabilitation </=45 minutes, 5 days per week (N = 43)**
% Female % Nominal	33	27
Mean age (SD) Mean (SD)	63 (NR)	66 (NR)
Time period since stroke (days) Mean (SD)	35 (NR)	41 (NR)

Outcomes

Study timepoints

- Baseline
- 3 month
- 6 month

dichotomous outcomes

Outcome	MDT rehabilitation >1-2 hours, 5 days per week, Baseline, N = 46	MDT rehabilitation >1-2 hours, 5 days per week, 3 month, N = 46	MDT rehabilitation >1-2 hours, 5 days per week, 6 month, N = 46	MDT rehabilitation </=45 minutes, 5 days per week, Baseline, N = 43	MDT rehabilitation </=45 minutes, 5 days per week, 3 month, N = 43	MDT rehabilitation </=45 minutes, 5 days per week, 6 month, N = 43
Discontinuation due to adverse events intervention group - 10 = death or serious illness resulting in non attendance, control group = 7 due to death or serious illness resulting in non attendance No of events	n = 0 ; % = 0	n = 5 ; % = 10.87	n = 10 ; % = 21.74	n = 0 ; % = 0	n = 3 ; % = 6.98	n = 7 ; % = 16.28

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

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

dichotomousoutcomes-Discontinuationduetoadverseevents-NoOfEvents-MDT rehabilitation >1-2 hours, 5 days per week-MDT rehabilitation </=45 minutes, 5 days per week-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low *(incomplete information reported for other outcomes. no SDs or measure of confidence reported)*
Overall bias and Directness	Overall Directness	Directly applicable

dichotomousoutcomes-Discontinuationduetoadverseevents-NoOfEvents-MDT rehabilitation >1-2 hours, 5 days per week-MDT rehabilitation </=45 minutes, 5 days per week-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low *(incomplete information reported for other outcomes. no SDs or measure of confidence reported)*
Overall bias and Directness	Overall Directness	Directly applicable

Stahl, 2018

Bibliographic Reference	Stahl, B.; Mohr, B.; Buscher, V.; Dreyer, F. R.; Lucchese, G.; Pulvermuller, F.; Efficacy of intensive aphasia therapy in patients with chronic stroke: a randomised controlled trial; Journal of Neurology, Neurosurgery & Psychiatry; 2018; vol. 89 (no. 6); 586-592

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	The trial was registered prospectively (German Clinical Trials Register; identifier: DRKS00007829).
Study location	germany
Study setting	outpatient centre
Study dates	2015-2016
Sources of funding	The current trial was supported by the Deutsche Forschungsgemeinschaft (Pu 97/15-1 to FP) and the Deutsche Akademische Austauschdienst (fellowship to GL).
Inclusion criteria	The inclusion criteria were as follows: diagnosis of aphasia, as confirmed by the Aachen Aphasia Test (AAT)9 ; chronic stage of symptoms at least 1year post-onset of stroke to prevent non-treatment effects related to spontaneous recovery; German as first native language; and right-handedness according to the Edinburgh Handedness Inventory.
Exclusion criteria	The exclusion criteria were as follows: aphasia due to traumatic brain injury or neurodegenerative disease; severe non-verbal cognitive deficits, as confirmed by the Corsi Block-Tapping Task; severe uncorrected vision or hearing disorders; other untreated medical conditions; and intensive SLT in the 2years prior to study enrolment.

Recruitment / selection of participants	Recruitment was administered in collaboration with several local rehabilitation centres and support groups for individuals with aphasia. After routine referral to the study team, participants were contacted the potential participants and invited them to a screening session to check their eligibility.
Intervention(s)	3 x weekly sessions for a total of 4 hours totalling 12 hours per week. Training intervals involved overall 48 hours of practice within 4 weeks. Patients completed all training sessions and did not attend any other form of SLT throughout the entire trial. Concomitant therapy: ILAT required patients to engage in everyday request and planning communication with related social interaction. Groups of three patients and a therapist were seated around a table and provided with picture cards showing different objects (e.g., bottle) or action scenes (e.g., drinking). Barriers on the table prevented players from seeing each others' cards. Each card had a duplicate that was owned by one of the other players. The goal was to obtain this duplicate from a fellow player by requesting the depicted object (e.g., 'Give me the […]') or by proposing an action based on the visualised scene (e.g., 'Let's […] together'). If the duplicate was available, the players compared the depicted objects or action scenes. In the case of a match, the addressee handed over the corresponding card to the person who initiated the request or action-planning sequence. If the duplicate was not available, the addressee rejected the request or proposed action. In the event of misunderstandings, the players asked clarifying questions. The complexity of the communicative interaction was tailored to the patients' individual language skills by varying the difficulty level of the target words and sentence structures. Treatment was delivered by four therapists who received special training and continuous supervision before and during the trial. Notably, the selection and number of therapists did not differ between the treatment groups. Cohorts of three patients who were relatively heterogeneous with regard to symptom severity underwent ILAT with the degree of massed practice determined by the randomisation procedure described above (4hours vs 2hours of daily training). Therapy frequency was consistent across treatment groups (always 3weekly sessions). Both treatment groups went through an initial waiting period and two successive training intervals. Each phase lasted 2weeks (six consecutive working days, always separated by a weekend). Depending on the intensity level, the two training intervals involved overall 48hours (Group I) or 24hours of practice (Group II) within 4weeks. Patients completed all training sessions and did not attend any other form of SLT throughout the entire trial

Population subgroups	speech and language therapists
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only

Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	3 x weekly sessions for a total of 2 hours totalling 6 hours per week. Training intervals involved overall 24 hours of practice within 4 weeks. Patients completed all training sessions and did not attend any other form of SLT throughout the entire trial. Concomitant therapy: ILAT required patients to engage in everyday request and planning communication with related social interaction. Groups of three patients and a therapist were seated around a table and provided with picture cards showing different objects (e.g., bottle) or action scenes (e.g., drinking). Barriers on the table prevented players from seeing each others' cards. Each card had a duplicate that was owned by one of the other players. The goal was to obtain this duplicate from a fellow player by requesting the depicted object (e.g., 'Give me the […]') or by proposing an action based on the visualised scene (e.g., 'Let's […] together'). If the duplicate was available, the players compared the depicted objects or action scenes. In the case of a match, the addressee handed over the corresponding card to the person who initiated the request or action-planning sequence. If the duplicate was not available, the addressee rejected the request or proposed action. In the event of misunderstandings, the players asked clarifying questions. The complexity of the communicative interaction was tailored to the patients' individual language skills by varying the difficulty level of the target words and sentence structures. Treatment was delivered by four therapists who received special training and continuous supervision before and during the trial. Notably, the selection and number of therapists did not differ between the treatment groups. Cohorts of three patients who were relatively heterogeneous with regard to symptom severity underwent ILAT with the degree of massed practice determined by the randomisation procedure described above (4hours vs 2hours of daily training). Therapy frequency was consistent across treatment groups (always 3weekly sessions). Both treatment groups went through an initial waiting period and two successive training intervals. Each phase lasted 2weeks (six consecutive working days, always separated by a weekend).

Number of participants	30
Duration of follow-up	4 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	speech and language therapy group based hospital based social
Additional comments	NR

Study arms

SALT >2-4 hours, <5 days per week (N = 15)
Intensive Language-Action Therapy (ILAT, an expanded version of Constrained-Induced Aphasia Therapy requiring request and planning communication) 3 x weekly sessions for a total of 4 hours totalling 12 hours per week. Training intervals involved overall 48

hours of practice within 4weeks. Patients completed all training sessions and did not attend any other form of SLT throughout the entire trial.

SALT >1-2 hours, <5 days per week (N = 15)
Intensive Language-Action Therapy (ILAT, an expanded version of Constrained-Induced Aphasia Therapy requiring request and planning communication) 3 x weekly sessions for a total of 2 hours totalling 6 hours per week. Training intervals involved overall 24 hours of practice within 4 weeks. Patients completed all training sessions and did not attend any other form of SLT throughout the entire trial.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	SALT >2-4 hours, <5 days per week (N = 15)	SALT >1-2 hours, <5 days per week (N = 15)
% Female Nominal	47	40
Mean age (SD) Mean (SD)	58.5 (14.3)	61.8 (16.5)
Time period since stroke (Months) Mean (SD)	63 (62.3)	67.4 (70.5)

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	SALT >2-4 hours, <5 days per week, Baseline, N = 15	SALT >2-4 hours, <5 days per week, 4 week, N = 15	SALT >1-2 hours, <5 days per week, Baseline, N = 15	SALT >1-2 hours, <5 days per week, 4 week, N = 15
Impairment specific measures - functional communication -Aachen Aphasia Test (states results are mean (CI) but only one value provided) Language performance was measured on four subscales of	49.7 (3.7)	52.7 (4.7)	51.2 (4.5)	53.4 (4.8)

Outcome	SALT >2-4 hours, <5 days per week, Baseline, N = 15	SALT >2-4 hours, <5 days per week, 4 week, N = 15	SALT >1-2 hours, <5 days per week, Baseline, N = 15	SALT >1-2 hours, <5 days per week, 4 week, N = 15
the battery: Token Test, Repetition, Naming and Comprehension Mean (SD)				
communication - unclear which catergory? - Action Communication Test (study states results are mean (CI) but only one value is reported so extracted this but may not be useable) unsure of the scale Mean (SD)	49.1 (4.7)	50.2 (4.9)	50.9 (5.5)	54 (5.6)
Discontinuation Nominal	0	0	0	0

Impairment specific measures - functional communication -Aachen Aphasia Test - Polarity - Higher values are better
communication - unclear which catergory? - Action Communication Test - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

4weekoutcomes-Discontinuation-Nominal-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t4

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

4weekoutcomes-communication-ActionCommunicationTest-MeanSD-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t4

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

4weekoutcomes-Impairmentspecificmeasures-functionalcommunication-AachenAphasiaTest-MeanSD-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t4

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

Takatori, 2012

Bibliographic Reference	Takatori, K.; Matsumoto, D.; Okada, Y.; Nakamura, J.; Shomoto, K.; Effect of intensive rehabilitation on physical function and arterial function in community-dwelling chronic stroke survivors; Topics in Stroke Rehabilitation; 2012; vol. 19 (no. 5); 377-383

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	Nr
Study location	Japan
Study setting	community based outpatient rehabilitation programme
Study dates	NR
Sources of funding	No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organisation with which the authors are associated.

Inclusion criteria	inclusion criteria were; being able to understand and respond to verbal commands with a score higher than 24 on the mini-mental state examination, being able to walk independently for at least 10 m (with or without assistive devices), and onset of stroke more than 1 year previously to study entry.
Exclusion criteria	patients were excluded who had severe higher brain dysfunction or painful joint disease of the upper or lower extremities.
Recruitment / selection of participants	89 community dwelling stroke outpatients from a day-care facility were screened for possible inclusion in the study.
Intervention(s)	The experimental group (n = 22) received primarily intensive strengthening exercise for 2 hours per session, 2 days per week. Both groups underwent the rehabilitation program for 12 weeks. In the experimental group the exercises consisted of warming up, muscle strengthening, stretching, balance exercises and aerobic exercises, which were carried out in a training room prepared for this study under the individualised instruction of physiotherapists. Strength training was performed using strength training machines along with a whole body vibration system. The amount of load added was individualised to the patient. Aerobic exercises was implemented using a treadmill.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control group received standard physical therapy consisting mainly of stretching of the muscle of upper and lower extremity and gait training for 40 minutes per sessions 2 days per week. Both groups underwent the rehabilitation program for 12 weeks. (dose = 16 mins per session if 5 days per week)
Number of participants	44
Duration of follow-up	12 weeks

Indirectness	NR
Elements of the study relating to qualitative themes	Intensity tailored to the individual - the room was individualised to the patient and the load was tailored to the individual hospital based supervised individual
Additional comments	NR

Study arms

Physiotherapy 1 hour to 2 hours, <5 days per week (N = 22)
The experimental group (n = 22) received primarily intensive strengthening exercise for 2 hours per session, 2 days per week. Both groups underwent the rehabilitation program for 12 weeks.

physiotherapy </= 45 mins, <5 days per week (N = 22)
The control group received standard physical therapy consisting mainly of stretching and gait training for 40 minutes per sessions 2 days per week. Both groups underwent the rehabilitation program for 12 weeks. (dose = 16 mins per session if 5 days per week)

Characteristics

Study-level characteristics

Characteristic	Study (N = 44)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	Physiotherapy 1 hour to 2 hours, <5 days per week (N = 22)	physiotherapy </= 45 mins, <5 days per week (N = 22)
% Female Nominal	32	23
Mean age (SD) Mean (SD)	66 (6.9)	71.1 (10.1)

Characteristic	Physiotherapy 1 hour to 2 hours, <5 days per week (N = 22)	physiotherapy </= 45 mins, <5 days per week (N = 22)
Time period since stroke Nominal	NR	NR

Outcomes

Study timepoints

- Baseline
- 12 week

12 week outcomes

Outcome	Physiotherapy 1 hour to 2 hours, <5 days per week, Baseline, N = 22	Physiotherapy 1 hour to 2 hours, <5 days per week, 12 week, N = 22	physiotherapy </= 45 mins, <5 days per week, Baseline, N = 22	physiotherapy </= 45 mins, <5 days per week, 12 week, N = 22
Physical function - lowerlimb - timed up and go Mean (SD)	15.4 (10.1)	15.4 (11.1)	20.4 (15)	21.2 (14.4)
physical function - upper limb - grip strength (kg) Mean (SD)	27.3 (9.5)	27.2 (9.3)	18.9 (6.7)	19.9 (7.2)

Outcome	Physiotherapy 1 hour to 2 hours, <5 days per week, Baseline, N = 22	Physiotherapy 1 hour to 2 hours, <5 days per week, 12 week, N = 22	physiotherapy </= 45 mins, <5 days per week, Baseline, N = 22	physiotherapy </= 45 mins, <5 days per week, 12 week, N = 22
Discontinuation No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Physical function - lowerlimb - timed up and go - Polarity - Lower values are better
physical function - upper limb - grip strength - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

12weekoutcomes-Physicalfunction-lowerlimb-timedupandgo-MeanSD-Physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </= 45 mins, 5 days per week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due not not fully randomised)*
Overall bias and Directness	Overall Directness	Directly applicable

12weekoutcomes-Discontinuation-NoOfEvents-Physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </= 45 mins, 5 days per week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due not not fully randomised)*
Overall bias and Directness	Overall Directness	Directly applicable

12weekoutcomes-physicalfunction-upperlimb-gripstrength-MeanSD-Physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </= 45 mins, 5 days per week-t12

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High *(due not not fully randomised)*
Overall bias and Directness	Overall Directness	Directly applicable

Taravati, 2022

Bibliographic Reference	Taravati, Sahel; Capaci, Kazim; Uzumcugil, Hale; Tanigor, Goksel; Evaluation of an upper limb robotic rehabilitation program on motor functions, quality of life, cognition, and emotional status in patients with stroke: a randomized controlled study.; Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology; 2022; vol. 43 (no. 2); 1177-1188

Study details

Secondary publication of another included study- see primary study for details	No additional information.
Other publications associated with this study included in review	No additional information.
Trial name / registration number	Clinicaltrials.gov = NCT04393480
Study type	Randomised controlled trial (RCT)
Study location	Turkey
Study setting	Outpatient follow up
Study dates	April 2016 and April 2019
Sources of funding	No additional information.
Inclusion criteria	A single stroke; being an adult; having a duration of 4 to 30 months after stroke; a score greater than 16 in mini-mental test; upper extremity Brunnstrom stage 2 or higher; being a fluent speaker in Turkish.
Exclusion criteria	People with severe apraxia; skin ulcers; multiple strokes; severe decompensated comorbidities (cardiopulmonary, neurological, orthopedic and psychiatric, etc.); cardiac pacemakers; severe neuropsychological impairments (global aphasia evaluated with a neurological examination and, when necessary, with an aphasia test); neglect syndrome (Star Cancellation Test score lower than 44 points); spasticity in the upper extremities greater than 3 in the Modified Ashworth

	Scale; severe joint contractures; a history of botulinum toxin injections in their upper extremity; history of dose changes in drugs for spasticity in the last 3 months.
Recruitment / selection of participants	People admitted to the Physical Medicine and Rehabilitation Department of the institution between April 2016 and April 2019.
Intervention(s)	Physiotherapy - 1-2 hours, 5 days a week N=22 Robot arm therapy for 30-45 minutes, 5 days a week in addition to conventional rehabilitation using a ReoGo-Motorika upper extremity rehabilitation system. Upper extremity exercises using 2D and 3D movement selection features. Continuous passive movement, active-assisted movement and active-resistant movement were possible. The device included five operating modes that gradually increase the load and movement complexity. There is a computer screen in front of the person and the person's affected upper extremity is fixed to the apparatus that moves the arm with the help of rubber bands. Using the stimuli on the screen as cues, the person is asked to move the affected arm. Robotic therapy is carried out under the supervision of a physiotherapist who controls the device. The system provides detailed feedback on the person's progress, monitoring and tracking of movement quality. Resistance, speed, scaling, mode, exercise repetition and size adjustments can be made. Games can be used in conjunction with the technology. People were instructed to use their arm and hand movements to reach virtual targets in the screen in front of them when placed in the robotic rehabilitation system. The system helped them to levitate their affected arm against gravity and they were asked to use the apparatus strapped to their arms to perform activities analogous to daily life in a simulation such as carrying a small object to a target. When the voluntary force produce by a muscle was not enough, it was compensated by a computer system and the upper extremity gained a three-dimensional motion capability. Concomitant therapy: Conventional rehabilitation exercises carried out by a physiotherapy. These included range of movement exercises, muscle strengthening, balance and mobility training, exercises for enhancing activities of daily life, neurophysiological exercises (mostly based on the Bobath technique), bed movements, bridge building, sitting and transfer training, gait training, proprioceptive exercises, balance exercises, occupational therapy (60 minutes daily) and cognitive rehabilitative by an experience psychologists given to those with cognitive impairment (45 minutes, twice a week).

Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	No additional information.
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Multidisciplinary team
Comparator	Physiotherapy - 45 minutes-1 hour, 5 days a week N=23 Usual care only. Concomitant therapy: Conventional rehabilitation exercises carried out by a physiotherapy. These included range of movement exercises, muscle strengthening, balance and mobility training, exercises for enhancing activities of daily life, neurophysiological exercises (mostly based on the Bobath technique), bed movements, bridge building, sitting and transfer training, gait training, proprioceptive exercises, balance exercises, occupational therapy (60 minutes daily) and cognitive rehabilitative by an experience psychologists given to those with cognitive impairment (45 minutes, twice a week).
Number of participants	45
Duration of follow-up	4 weeks (end of intervention)
Indirectness	No additional information
Elements of the study relating to qualitative themes	Individual therapy Telerehabilitation, assistive technology and computer-based tools Variety in activities and choice - the robot allowed for the use of games

	Provision of feedback - the robot allowed for feedback to be provided with lots of details (as reported in the qualitative research) Use of expensive/additional equipment - Required additional equipment Hospital care - Was conducted in hospital Supervision - Required supervision
Additional comments	Method of analysis unclear. Appears to be completers only.

Study arms

Physiotherapy - >1-2 hours, 5 days a week (N = 22)
Robot arm therapy for 30-45 minutes, 5 days a week in addition to conventional rehabilitation using a ReoGo-Motorika upper extremity rehabilitation system. Upper extremity exercises using 2D and 3D movement selection features. Continuous passive movement, active-assisted movement and active-resistant movement were possible. The device included five operating modes that gradually increase the load and movement complexity. There is a computer screen in front of the person and the person's affected upper extremity is fixed to the apparatus that moves the arm with the help of rubber bands. Using the stimuli on the screen as cues, the person is asked to move the affected arm. Robotic therapy is carried out under the supervision of a physiotherapist who controls the device. The system provides detailed feedback on the person's progress, monitoring and tracking of movement quality. Resistance, speed, scaling, mode, exercise repetition and size adjustments can be made. Games can be used in conjunction with the technology. People were instructed to use their arm and hand movements to reach virtual targets in the screen in front of them when placed in the robotic rehabilitation system. The system helped them to levitate their affected arm against gravity and they were asked to use the apparatus strapped to their arms to perform activities analogous to daily life in a simulation such as carrying a small object to a target. When the voluntary force produce by a muscle was not enough, it was compensated by a computer system and the upper extremity gained a three-dimensional motion capability. Concomitant therapy: Conventional rehabilitation exercises carried out by a physiotherapy. These included range of movement exercises, muscle strengthening, balance and mobility training, exercises for enhancing activities of daily life, neurophysiological exercises (mostly based on the Bobath technique), bed movements, bridge

building, sitting and transfer training, gait training, proprioceptive exercises, balance exercises, occupational therapy (60 minutes daily) and cognitive rehabilitative by an experience psychologists given to those with cognitive impairment (45 minutes, twice a week).

Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 23)
Usual care only. Concomitant therapy: Conventional rehabilitation exercises carried out by a physiotherapy. These included range of movement exercises, muscle strengthening, balance and mobility training, exercises for enhancing activities of daily life, neurophysiological exercises (mostly based on the Bobath technique), bed movements, bridge building, sitting and transfer training, gait training, proprioceptive exercises, balance exercises, occupational therapy (60 minutes daily) and cognitive rehabilitative by an experience psychologists given to those with cognitive impairment (45 minutes, twice a week).

Characteristics

Arm-level characteristics

Characteristic	**Physiotherapy - >1-2 hours, 5 days a week (N = 22)**	**Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 23)**
% Female Sample size	n = 3 ; % = 17.65	n = 6 ; % = 30
Mean age (SD) (years) Mean (SD)	50.94 (17.2)	55.75 (11.61)
Ethnicity Sample size	n = NA ; % = NA	n = NA ; % = NA
Comorbidities Sample size	n = NA ; % = NA	n = NA ; % = NA

Characteristic	Physiotherapy - >1-2 hours, 5 days a week (N = 22)	Physiotherapy - >45 minutes-1 hour, 5 days a week (N = 23)
Severity Sample size	n = NA ; % = NA	n = NA ; % = NA
Time period since stroke (Months) Mean (SD)	10.94 (8.02)	12.65 (8.42)
Type of communication difficulty Sample size	n = NR ; % = NR	n = NR ; % = NR

Outcomes

Study timepoints

- Baseline
- 4 week (<6 months)

Continuous outcomes

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 17	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 17	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 20
Physical function - upper limb (Fugl Meyer Assessment - Upper	19 (10.46)	24.24 (10.02)	21.05 (10.85)	23.35 (10.01)

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 17	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 17	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 20	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 20
Extremity) Scale range: 0-66. Final values. Mean (SD)				
Activities of daily living (functional independence measure) Scale range: 18-126. Final values. Mean (SD)	86.06 (26.2)	96.47 (23.55)	83.6 (23.7)	93.15 (21.99)
Person/participant health-related quality of life (Stroke Specific Quality of Life Scale) Scale range: 49-245. Final values. Mean (SD)	118.65 (28.53)	138.59 (34.3)	133.75 (27.72)	140.8 (30.72)
Psychological distress - Depression (Center for Epidemiological Studies - Depression) Scale range: 0-60. Final values. Mean (SD)	29.18 (11.14)	19.41 (8.32)	27.5 (9.5)	26.1 (8.18)

Physical function - upper limb (Fugl Meyer Assessment - Upper Extremity) - Polarity - Higher values are better
Activities of daily living (functional independence measure) - Polarity - Higher values are better
Person/participant health-related quality of life (Stroke Specific Quality of Life Scale) - Polarity - Higher values are better
Psychological distress - Depression (Center for Epidemiological Studies - Depression) - Polarity - Lower values are better

Dichotomous outcome

Outcome	Physiotherapy - >1-2 hours, 5 days a week, Baseline, N = 22	Physiotherapy - >1-2 hours, 5 days a week, 4 week, N = 22	Physiotherapy - >45 minutes-1 hour, 5 days a week, Baseline, N = 23	Physiotherapy - >45 minutes-1 hour, 5 days a week, 4 week, N = 23
Discontinuation from study Intervention = 1 pneumonia, 2 general health disorders, 1 tumour recurrence, 1 voluntary withdrawal. Control = 1 general health disorders, 2 voluntary withdrawal. No of events	n = NA ; % = NA	n = 5 ; % = 23	n = NA ; % = NA	n = 3 ; % = 13

Discontinuation from study - Polarity - Lower values are better

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

Continuousoutcomes-Physicalfunction-upperextremity(FuglMeyerAssessment-upperextremity)-MeanSD-Physiotherapy - 1-2 hours, 5 days a week-Physiotherapy - 45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Activitiesofdailyliving(functionalindependencemeasure)-MeanSD-Physiotherapy - 1-2 hours, 5 days a week-Physiotherapy - 45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Psychologicaldistress-Depression(CenterforEpidemiologicalStudies-Depression)-MeanSD-Physiotherapy - 1-2 hours, 5 days a week-Physiotherapy - 45 minutes-1 hour, 5 days a week-t4

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

Dichotomousoutcome-Withdrawalduetoadverseevents-NoOfEvents-Physiotherapy - 1-2 hours, 5 days a week-Physiotherapy - 45 minutes-1 hour, 5 days a week-t4

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

Continuousoutcomes-Person/participanthealth-relatedqualityoflife(StrokeSpecificQualityofLifeScale)-MeanSD-Physiotherapy - >1-2 hours, 5 days a week-Physiotherapy - >45 minutes-1 hour, 5 days a week-t4

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

Thomas, 2013

Bibliographic Reference	Thomas, S. A.; Walker, M. F.; Macniven, J. A.; Haworth, H.; Lincoln, N. B.; Communication and Low Mood (CALM): a randomized controlled trial of behavioural therapy for stroke patients with aphasia; Clinical Rehabilitation; 2013; vol. 27 (no. 5); 398-408

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	(ISRCTN56078830)
Study location	UK
Study setting	community stroke rehabilitation
Study dates	28 April 2008 and 12 January 2011
Sources of funding	This work was supported by The Stroke Association, UK (TSA 2007/03).
Inclusion criteria	Stroke patients with aphasia were identified on hospital wards, and asked if they were willing to be contacted after discharge from hospital. In addition, referrals were sought from community stroke and rehabilitation services and speech and language therapists. People attending stroke and communication groups in the community were also invited to take part. Potential participants were given an information sheet and invited to consent to have their mood screened. Mood was assessed using the ‘sad’ item of the Visual Analog Mood Scales16 and the Stroke Aphasic Depression Questionnaire 10-item hospital version,17 completed by a nurse, relative or carer. Those who were identified as having low mood on either the visual analogue ‘sad’ item (cut-off >50) or the Stroke Aphasic Depression Questionnaire (cut-off >6)18 were then invited to consent to take part in the randomized trial.
Exclusion criteria	People were excluded if they were blind or deaf, had dementia documented in their medical notes, were unable to speak English prior to stroke, or were receiving any treatment for depression at the time of their stroke.
Recruitment / selection of participants	Stroke patients with aphasia were identified on hospital wards, and asked if they were willing to be contacted after discharge from hospital. In addition, referrals were sought from community stroke and rehabilitation services and speech and language therapists. People attending stroke and communication groups in the community were also invited to take part. Potential participants were identified in six centres (Nottingham, Mansfield, Chesterfield, Sheffield, Lincoln and Leicester), between 28 April 2008 and 12 January 2011.
Intervention(s)	Behavioural therapy plus usual care. After randomization, participants allocated to receive behavioural therapy received up to 20 sessions of treatment over three months, with each session lasting approximately 1 hour. Sessions took place at the participant’s place of residence. Therapy was delivered by an assistant psychologist supervised weekly by a clinical psychologist. There was an assistant psychologist based in each of four centres. The additional two centres (Mansfield and Lincoln) were covered by assistants from Chesterfield and Nottingham. In addition, all assistant psychologists attended a

	joint monthly supervision meeting with a consultant clinical neuropsychologist (JM). The assistant psychologists received training in supported communication from speech and language therapists and were provided with a therapy manual. The intensity of therapy was left to the discretion of the assistant psychologist. Treatment strategies focused on maximizing mood-elevating activities and included education, activity monitoring, activity scheduling, and graded task assignments. The intervention was tailored to the individual's needs, and communication resources, such as pictures, photographs and letter charts, were used. The delivery of therapy was monitored by observation of therapy sessions by the chief investigator (ST). The content of therapy was documented using record forms completed by the assistant psychologist after each session. The optimum intensity and duration of therapy are unknown and it was left to the therapist's discretion to decide how much treatment to provide. No patients required the maximum 20 sessions allowed, indicating that the intervention did not need to be delivered as intensively as expected. Concomitant therapy: Usual care (all other services available in usual practice). No further details provided.
Population subgroups	assistant psychologist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Mood
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Other assistant psychologists
Comparator	Usual care (all other services available in usual practice). No further details provided.
Number of participants	105
Duration of follow-up	3 and 6 months
Indirectness	NR

Elements of the study relating to qualitative themes	people with communication difficulties intensity tailored to the individual and determined by the treating psychologist - The intervention was tailored to the individual's needs, and communication resources, such as pictures, photographs and letter charts, were used. The optimum intensity and duration of therapy are unknown and it was left to the therapist's discretion to decide how much treatment to provide. No patients required the maximum 20 sessions allowed, indicating that the intervention did not need to be delivered as intensively as expected. individual therapy hospital based
Additional comments	NR

Study arms

cognitive/psychological therapy </45 mins, 5 days per week + usual care (N = 51)
Participants allocated to receive behavioural therapy received up to 20 sessions of treatment over three months, with each session lasting approximately 1 hour in additional to usual care. Sessions took place at the participant's place of residence. Therapy was delivered by an assistant psychologist supervised weekly by a clinical psychologist. Patients allocated to either group received all other services that were available to them as local practice. The optimum intensity and duration of therapy are unknown and it was left to the therapist's discretion to decide how much treatment to provide. No patients required the maximum 20 sessions allowed,

indicating that the intervention did not need to be delivered as intensively as expected. on average patients received around 10 sessions.

Usual care - intensity not reported (N = 54)
usual care - Patients allocated to this group received all other services that were available to them as local practice

Characteristics

Study-level characteristics

Characteristic	**Study (N = 105)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	cognitive/psychological therapy </45 mins, 5 days per week + usual care (N = 51)	Usual care - intensity not reported (N = 54)
% Female Nominal	31	43
Mean age (SD) Mean (SD)	68.5 (13.1)	65.5 (13.9)
Time period since stroke Median (IQR)	8.7 (4.1 to 26.1)	9 (4.9 to 39)

Outcomes

Study timepoints

- Baseline
- 6 month
- 3 month

6 and 3 month outcomes

Outcome	**cognitive/psychological therapy </45 mins, 5 days per week + usual care, Baseline, N = 51**	**cognitive/psychological therapy </45 mins, 5 days per week + usual care, 6 month, N = 39**	**cognitive/psychological therapy </45 mins, 5 days per week + usual care, 3 month, N = 39**	**Usual care - intensity not reported, Baseline, N = 54**	**Usual care - intensity not reported, 6 month, N = 42**	**Usual care - intensity not reported, 3 month, N = 44**
psychological distress - Prorated Stroke Aphasic Depression Questionnaire Hospital version 21 0-30 Mean (SD)	23.4 (12.2)	17.4 (10)	16.9 (10.2)	20.1 (9)	21.9 (9.5)	19.2 (9.6)
carer QOL - Carer Strain Index (out of n=37 intevention and n=36 control) 0-13 Mean (SD)	NR (NR)	6.6 (3.1)	NR (*empty data*)	NR (NR)	6.3 (3.6)	NR (*empty data*)
ADL/participation? - Nottingham Leisure Questionnaire (out of n=43 6 months and 3 months n= 41 intervention group. control n= 46 at 6 months and 48 at 3	NR (NR)	17 (7.6)	17.1 (6.7)	NR (NR)	15.9 (6.8)	15.7 (6.9)

Outcome	cognitive/psychological therapy </45 mins, 5 days per week + usual care, Baseline, N = 51	cognitive/psychological therapy </45 mins, 5 days per week + usual care, 6 month, N = 39	cognitive/psychological therapy </45 mins, 5 days per week + usual care, 3 month, N = 39	Usual care - intensity not reported, Baseline, N = 54	Usual care - intensity not reported, 6 month, N = 42	Usual care - intensity not reported, 3 month, N = 44
months) 0-60 Mean (SD)						
Discontinuation intervention group = 9 declined FU, 2 too ill to be assessed, 3 missed 3 month FU but were assessed at 6 months, control group = 4 declined FU, 2 too ill to be assessed, 2 died No of events	n = 0 ; % = 0	n = 14 ; % = 27	n = 10 ; % = 19	n = 0 ; % = 0	n = 8 ; % = 14.1	n = 6 ; % = 11

psychological distress - Prorated Stroke Aphasic Depression Questionnaire Hospital version 21 - Polarity - Lower values are better
carer QOL - Carer Strain Index - Polarity - Lower values are better
ADL/participation? - Nottingham Leisure Questionnaire - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

6monthoutcomes-Discontinuation-NoOfEvents-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t6

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

6monthoutcomes-ADL/participation?-NottinghamLeisureQuestionnaire-MeanSD-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t6

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

6monthoutcomes-carerQOL-CarerStrainIndex-MeanSD-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t6

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

6monthoutcomes-psychologicaldistress-ProratedStrokeAphasicDepressionQuestionnaireHospitalversion21-MeanSD-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t6

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

6and3monthoutcomes-psychologicaldistress-ProratedStrokeAphasicDepressionQuestionnaireHospitalversion21-MeanSD-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t3

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

6and3monthoutcomes-ADL/participation?-NottinghamLeisureQuestionnaire-MeanSD-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t3

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

6and3monthoutcomes-Discontinuation-NoOfEvents-cognitive/psychological therapy </45 mins, 5 days per week + usual care-Usual care - intensity not reported-t3

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

Tollar, 2021

Bibliographic Reference	Tollar, J.; Nagy, F.; Csutoras, B.; Prontvai, N.; Nagy, Z.; Torok, K.; Blenyesi, E.; Vajda, Z.; Farkas, D.; Toth, B. E.; Repa, I.; Moizs, M.; Sipos, D.; Kedves, A.; Kovacs, A.; Hortobagyi, T.; High Frequency and Intensity Rehabilitation in 641 Subacute Ischemic Stroke Patients; Archives of Physical Medicine & Rehabilitation; 2021; vol. 102 (no. 1); 9-18

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR

Trial name / registration number	NR
Study location	Hungary
Study setting	outpatient physiotherapy clinics
Study dates	September 2014- September 2018
Sources of funding	NR
Inclusion criteria	All participants were outpatients. inclusion criteria were; first ever ischemic stroke diagnosed by a neurologist cased n computed tomography or MRI scans, time after stroke of 2-4 weeks, mobility and postural limitation determined by neurologic exam, and a modified Rankin Scale score of 2 or higher.
Exclusion criteria	Exclusion criteria included; a history of multiple strokes, systolic resting blood pressure less than 120 or greater than 160mmhg, orthostatic hypotension, carotid artery stenosis, severe heart disease haemophilia, traumatic brain injury, seizure disorder, uncontrolled diabetes, abnormal electroencephalography; mini mental state examination score less than 22, an abnormal bloody panel, use of sedatives, irregular medication schedule, serious aphasia, serious visual or hearing impairments, serious sensory dysfunction, serious orthopaedic problems, neurological conditions affecting motor function, alcoholism, recreational drug use, smoking after stroke diagnosis, inability to walk a minimum of 100 metres with or without a walking aid in 6 minutes, Berg balance scale score of 32 or less, Bathel index score of 70 or less, inability to understand verbal instructions or prompts from a TV screen, or current participation in a self-directed or formal group exercise programme other than standard physiotherapy.
Recruitment / selection of participants	Consecutive selection from the hospitals medical records, a neurologist identified and examined participants for admission to the study conducted during the period from Sept 2014- Sept 2018. patients admitted to the emergency department with a suspected stroke underwent a neurologic exam, which included the national institutes of health stroke scale.
Intervention(s)	The exergaming 2 group exercises twice daily for 1 hour per session. the 1 hour sessions comprised of 5 mins warm up, 25 mins exergaming, 25 mins of agility training and 5 mins of cool-down. this consisted of 5 sessions per week for 5 weeks in the hospitals outpatient physiotherapy gym. 2 physiotherapists delivered the intervention for groups of 6-8 participants who exercises barefoot on soft gym mats. Exergaming using the Xbox 360 core system and 3 modules including , Just dance,

	Space Pop and Reflex ridge. the agility component included the manipulation and transport of hand held sensory tools, weighted bars, fitness balls and Pilates equipment. Concomitant therapy: After the exercises sessions every participants in each group received 20 minutes of medical massage of the lower extremities.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The exergaming 1 group exercised once daily for 1 hour per session. the 1 hour session comprised of 5 mins warm up, 25 mins exergaming, 25 mins of agility training and 5 mins of cool-down. this consisted of 5 sessions per week for 5 weeks in the hospitals outpatient physiotherapy gym. 2 physiotherapists delivered the intervention for groups of 6-8 participants who exercises barefoot on soft gym mats. Exergaming using the Xbox 360 core system and 3 modules including , Just dance, Space Pop and Reflex ridge. the agility component included the manipulation and transport of hand held sensory tools, weighted bars, fitness balls and Pilates equipment. This intervention arm has been combined with the control arm for the purposes of this review as both intervention's are for 1 hour. The control group received government prescribed standard care, which included 30 mins of daily group exercises and 30 mins of individual physical therapy using walking and balance exercises at local clinics. After the exercises sessions every participants in each group received 20 minutes of medical massage of the lower extremities.

Number of participants	680
Duration of follow-up	5 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	computer based tools group based therapy hospital based therapy
Additional comments	NR

Study arms

physiotherapy >1-2 hours, 5 days per week (N = 290)
2 x 1 hour sessions of exergaming, 5 days per week for 5 weeks. All patients received 20 minutes of medical massage after the interventions.

physiotherapy 45 mins - 1 hour, 5 days per week (N = 390)
1 x 1 hour exergaming session, 5 days per week for 5 weeks. combined with control arm. control group received 30 minutes daily of group exercises and 30 minutes of individual exercise therapy at local clinics. all patients received 20 minutes of medial massage after the interventions.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 641)**
Mean age (SD) (years) Mean (SD)	66.5 (5.87)
Ethnicity Nominal	NR
Comorbidities (%) Nominal	NR
Hypertension % Nominal	27
Ischemic heart disease % Nominal	19
Atherosclerosis %	10

Characteristic	Study (N = 641)
Nominal	
Severity Nominal	NR
Time period since stroke Mean (SD)	2.9 (0.75)
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy >1-2 hours, 5 days per week (N = 290)	physiotherapy 45 mins - 1 hour, 5 days per week (N = 390)
% Female Nominal	46	45

Outcomes

Study timepoints

- Baseline
- 5 week

5 week outcomes

Outcome	physiotherapy >1-2 hours, 5 days per week, Baseline, N = 290	physiotherapy >1-2 hours, 5 days per week, 5 week, N = 286	physiotherapy 45 mins - 1 hour, 5 days per week, Baseline, N = 390	physiotherapy 45 mins - 1 hour, 5 days per week, 5 week, N = 355
patient quality of life - EQ-VAS 0-100 (change score) Mean (SD)	63.6 (9.41)	9.5 (8.74)	64.2 (9.32)	4.85 (8.25)
modified rankin scale 0-6 (change score) Mean (SD)	3.4 (0.64)	-1.8 (0.81)	3.38 (0.66)	-1.24 (0.95)
ADLs - Barthel Index 0-100 (change score) Mean (SD)	56.2 (8.04)	27.2 (8.92)	56 (8.4)	17.1 (12.1)
physical function - lower limb - BBS 0-56 (change score) Mean (SD)	22.2 (4.49)	6.8 (6.28)	22.8 (4.6)	4.2 (6)
Discontinuation drops outs all lost to FU. no further details No of events	n = 0 ; % = 0	n = 4 ; % = 1.38	n = 0 ; % = 0	n = 35 ; % = 8.97

patient quality of life - EQ-VAS - Polarity - Higher values are better
modified rankin scale - Polarity - Lower values are better
ADLs - Barthel Index - Polarity - Higher values are better
physical function - lower limb - BBS - Polarity - Higher values are better

Discontinuation - Polarity - Lower values are better

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

5weekoutcomes-EQ5D-sumchangescore-MeanSD-physiotherapy >1-2 hours, 5 days per week-physiotherapy 45 mins - 1 hour, 5 days per week-t5

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

5weekoutcomes-modifiedrankinscale-MeanSD-physiotherapy >1-2 hours, 5 days per week-physiotherapy 45 mins - 1 hour, 5 days per week-t5

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

5weekoutcomes-ADLs-BarthelIndex-MeanSD-physiotherapy >1-2 hours, 5 days per week-physiotherapy 45 mins - 1 hour, 5 days per week-t5

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

5weekoutcomes-physicalfunction-lowerlimb-BBS-MeanSD-physiotherapy >1-2 hours, 5 days per week-physiotherapy 45 mins - 1 hour, 5 days per week-t5

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

5weekoutcomes-Discontinuation-NoOfEvents-physiotherapy >1-2 hours, 5 days per week-physiotherapy 45 mins - 1 hour, 5 days per week-t5

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

Unal, 2020

Bibliographic Reference	Unal, A.; Altug, F.; Tikac, G.; Cavlak, U.; Effectiveness of matrix-rhythm therapy on increased muscle tone, balance and gait parameters in stroke survivors: a single-blinded, randomized, controlled clinical trial; Acta neurologica Belgica; 2020

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	NCT04213417
Study location	Turkey
Study setting	Neurorehabilitation unit
Study dates	January 2017 to December 2018
Sources of funding	Supported by the Pamukkale university scientific research commission grant
Inclusion criteria	Inclusion criteria required that subjects had been discharged from hospital, had single-sided hemiparesis for the first time at least 4 weeks earlier, Modified Rankin score of </=3 and modified Ashworth scale score between 1-5 for the lower extremity.
Exclusion criteria	The exclusion criteria included; subjects using a cardiac pacemaker, aphasia, open wound in the area to be treated, circulatory problem, skin lesions, other neurological, psychiatric or orthopaedic problems other than hemiparesis affecting gait.

Recruitment / selection of participants	NR
Intervention(s)	Matrix Rhythm therapy was applied to the study group in addition to Bobath therapy and was applied to the affected side of the body and lower extremity for 60 mins each session, 3 x per week. MRT is a vibrating massage tool which creates asymmetric pressure distribution in the tissue, stimulates pumping/suction effect and also stimulates nerve receptors. The treatment started from the thoracic region and a treatment direction was toward the lower extremity. During the treatment the patients active participation was ensured and and the treatment was combined with exercises. Concomitant therapy: Both groups were treated with Bobath therapy as a neurodevelopmental therapy. considering individual requirements and wishes of the patient, an exercise programme that supports active participation of the person was established. Each session was performed for 60 minutes, 3 days per week for 12 weeks.
Population subgroups	Physiotherapist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control group was treated with Bobath therapy as a neurodevelopmental therapy. considering individual requirements and wishes of the patient, an exercise programme that supports active participation of the person was established. Each session was performed for 60 minutes, 3 days per week for 12 weeks.
Number of participants	32
Duration of follow-up	4 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	Individual therapy

	Hospital based
Additional comments	NR

Study arms

Physiotherapy >1-2 hours, 5 days per week (N = 15)
Both groups received Bobath therapy for 60 minutes, 3 days per week for 4 weeks. In addition the experimental group received Matrix rhythm therapy for 60 minutes, 3 days per week for 4 weeks. Dose = 72 mins per day 5 days per week

Physiotherapy </=45 mins, 5 days per week (N = 15)
the control group received Bobath therapy for 60 minutes, 3 days per week for 4 weeks. dose for 5 days per week = 36 minutes per day

Characteristics

Study-level characteristics

Characteristic	**Study (N = 30)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR

Characteristic	Study (N = 30)
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	Physiotherapy >1-2 hours, 5 days per week (N = 15)	Physiotherapy </=45 mins, 5 days per week (N = 15)
% Female Nominal	53.3	53.3
Mean age (SD) Mean (SD)	51.93 (14.68)	47.27 (13.43)
Time period since stroke (Months) Mean (SD)	37.3 (37.29)	38.7 (39.59)

Outcomes

Study timepoints

- Baseline
- 4 week

4 week outcomes

Outcome	Physiotherapy >1-2 hours, 5 days per week, Baseline, N = 15	Physiotherapy >1-2 hours, 5 days per week, 4 week, N = 15	Physiotherapy </=45 mins, 5 days per week, Baseline, N = 15	Physiotherapy </=45 mins, 5 days per week, 4 week, N = 15
physical function - lower limb - timed up and go 0-3 Mean (SD)	0.93 (0.96)	2.33 (0.61)	1.26 (1.09)	1.93 (0.88)
Discontinuation intervention group - 1 due to re-surgery due to aneurism. control = 1 due to re-hospitalisation No of events	n = 0 ; % = 0	n = 1 ; % = 6	n = 0 ; % = 0	n = 1 ; % = 6

physical function - lower limb - timed up and go - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

4weekoutcomes-Discontinuation-NoOfEvents-Physiotherapy >1-2 hours, 5 days per week-Physiotherapy </=45 mins, 5 days per week-t4

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

4weekoutcomes-physicalfunction-lowerlimb-timedupandgo-MeanSD-Physiotherapy >1-2 hours, 5 days per week-Physiotherapy </=45 mins, 5 days per week-t4

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

Valkenborghs, 2019

Bibliographic Reference	Valkenborghs, S. R.; van Vliet, P.; Nilsson, M.; Zalewska, K.; Visser, M. M.; Erickson, K. I.; Callister, R.; Aerobic exercise and consecutive task-specific training (AExaCTT) for upper limb recovery after stroke: a randomized controlled pilot study; Physiotherapy research international; 2019; vol. 24 (no. 3); e1775

Study details

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

Other publications associated with this study included in review	Valkenboroughs 2017
Trial name / registration number	ACTRN12616000848404
Study location	rehabilitation centre and home based
Study setting	Australia
Study dates	NR
Sources of funding	funding was provided by a national stroke foundation of Australia seed grant and a faculty of health and medicine, university of Newcastle Australia research equipment grant. the main author is funded by a Jennie Thomas medical research grant.
Inclusion criteria	inclusion criteria; ≥ 16 years old, clinical diagnosis of ischaemic or haemorrhagic stroke, upper limb movement deficit, that is score <63 on the WMFT or <52 on the ARAT, able to undertake aerobic exercise training and GP medical clearance.
Exclusion criteria	Exclusion criteria were; upper limb movement deficits attributable to non stroke pathology, unable to lift hand off lap when asked to place hand behind head (gross motor task from the ARAT). severe fixed contractures of elbow or wrist (i.e., grade 4 on the modified Ashworth scale), moderate to severe receptive aphasia (<10 on "receptive skills" of Sheffield screening test for acquired language disorders)
Recruitment / selection of participants	20 people were recruited form a variety of community-based sources including the hunter medical research institute volunteer register by advertisement on the website of the nation stroke foundation and stroke recovery association of New South Wales.
Intervention(s)	Aerobic exercise - a high intensity interval approach was selected for its potential to enhance neuroplasticity, motor function and adherence. Participants were prescribed 4 x 4-minute intervals of high-intensity exercise (85% of HRmax) with a 3-minute active recovery (70% of HRmax) period between each interval per 30-min session. the exercise was performed

	on an upright or semi-recumbent cycle ergometer depending on individual ability and impairment. Task specific training (TST) preceded by aerobic exercise. The aerobic exercise + TST group performed 30 minutes of aerobic exercise immediately prior to the 1 hr of TST with the therapist, motor function and adherence. Concomitant therapy - participants in both groups performed 30 hours of supervised task specific training and were prescribed an additional 30 hours of home-based practice, the aim was to preform 100-300 repetitions of tasks per hour prescribed according to individual goals. the difficulty of each component was graded, reviewed and progressed according to the individual ability of the participant. participants recorded the number of repetition and time spent on each activity during home-based practice in weekly log sheets. both groups were prescribed 60 hr of TST over 10 weeks. (3 x 1-hr sessions with a therapist per week and 3 x 1 hr of home-base self-practice per week).
Population subgroups	Physiotherapist
Subgroup 1: Community-based vs. hospital-based	Community-based rehabilitation (not part of an early supported discharge intervention)
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Task specific training (TST). Participants in both groups performed 30 hours of supervised task specific training and were prescribed an additional 30 hours of home-based practice, the aim was to preform 100-300 repetitions of tasks per hour prescribed according to individual goals. the difficulty of each component was graded, reviewed and progressed according to the individual ability of the participant. participants recorded the number of repetition and time spent on each activity during home-based practice in weekly log sheets. both groups were prescribed 60 hr of TST over 10 weeks. (3 x 1-hr sessions with a therapist per week and 3 x 1 hr of home-base self-practice per week). Both groups were prescribed 60 hr of TST over 10 weeks. (3 x 1-hr sessions with a therapist per week and 3 x 1 hr of home-base self-practice per week).
Number of participants	20

Duration of follow-up	6 months
Indirectness	NR
Elements of the study relating to qualitative themes	Home based/self directed exercise (homework) hospital based therapy individual therapy supervised therapy more therapy - 37.5% would have preferred more than 3 sessions per week 25% would've like longer than 1.5 hours of individual sessions fatigue - 2 sometimes the exercise is too hard. I'm left too fatigued to do hand practice."
Additional comments	ITT last observation carried forward for missing data.

Study arms

physiotherapy >45 mins - 1 hour, 5 days per week (N = 9)
task specific training (TST) preceded by aerobic exercise. both groups were prescribed 60 hr of TST over 10 weeks. (3 x 1-hr sessions with a therapist per week and 3 x 1 hr of home-base self-practice per week). the aerobic exercise + TST group performed 30 minutes of aerobic exercise immediately proper to the 1 hr of TST with the therapist.

physiotherapy </=45 mins, 5 days per week (N = 11)
Task specific training only. Both groups were prescribed 60 hr of TST over 10 weeks. (3 x 1-hr sessions with a therapist per week and 3 x 1 hr of home-base self-practice per week).

Characteristics

Study-level characteristics

Characteristic	**Study (N = 20)**
Mean age (SD) Mean (SD)	55.4 (16)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Characteristic	Study (N = 20)
Time period since stroke (Months) Mean (SD)	71.7 (91.2)
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy >45 mins - 1 hour, 5 days per week (N = 9)	physiotherapy </=45 mins, 5 days per week (N = 11)
% Female Nominal	44	45

Outcomes

Study timepoints

- Baseline
- 6 month

6 months outcomes

Outcome	physiotherapy >45 mins - 1 hour, 5 days per week, Baseline, N = 9	physiotherapy >45 mins - 1 hour, 5 days per week, 6 month, N = 9	physiotherapy </=45 mins, 5 days per week, Baseline, N = 11	physiotherapy </=45 mins, 5 days per week, 6 month, N = 11
Discontinuation experimental group - 1 drop out due to bronchitis. control drop outs - no details No of events	n = 0 ; % = 0	n = 1 ; % = 11.1	n = 0 ; % = 0	n = 2 ; % = 18.18
physical function - upper limb ARAT 0-57 Mean (SD)	9.7 (12.4)	11.8 (14.3)	12.4 (17.2)	14.8 (19.7)
stroke specific QOL -stroke impact scale - strength 0-80 Mean (SD)	23.4 (11.4)	32.8 (10.9)	35.9 (19.1)	45 (20.5)
stroke specific QOL -stroke impact scale - memory 0-80 Mean (SD)	53 (20.2)	65.7 (12.7)	58.7 (17.9)	61.8 (15.6)
stroke specific QOL -stroke impact scale - mood 0-80 Mean (SD)	39.2 (18.9)	53.6 (18.2)	58.4 (16.9)	58.4 (11.9)

Outcome	physiotherapy >45 mins - 1 hour, 5 days per week, Baseline, N = 9	physiotherapy >45 mins - 1 hour, 5 days per week, 6 month, N = 9	physiotherapy </=45 mins, 5 days per week, Baseline, N = 11	physiotherapy </=45 mins, 5 days per week, 6 month, N = 11
stroke specific QOL -stroke impact scale - communication 0-80 Mean (SD)	51.1 (27.1)	59.4 (21.2)	54 (24.4)	58.7 (18.7)
stroke specific QOL -stroke impact scale - ADL 0-80 Mean (SD)	43.8 (11.5)	49.6 (12)	58.4 (17.3)	58.6 (17.3)
stroke specific QOL -stroke impact scale - mobility 0-80 Mean (SD)	51.1 (12.4)	59 (15.1)	61 (16.1)	63.8 (11.9)
stroke specific QOL -stroke impact scale - hand use 0-80 Mean (SD)	8.4 (18.6)	18.7 (26.6)	27.3 (30.6)	24 (23.6)
stroke specific QOL -stroke impact scale - Activities 0-80 Mean (SD)	25.3 (14.1)	37.5 (16.4)	49.1 (23.1)	55 (17.7)

Discontinuation - Polarity - Lower values are better
physical function - upper limb ARAT - Polarity - Higher values are better

stroke specific QOL -stroke impact scale - strength - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - memory - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - mood - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - communication - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - ADL - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - mobility - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - hand use - Polarity - Higher values are better
stroke specific QOL -stroke impact scale - Activities - Polarity - Higher values are better

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

6monthsoutcomes-Discontinuation-NoOfEvents-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-physicalfunction-upperlimbARAT-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-strength-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-Activities-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-handuse-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-mobility-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-ADL-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-communication-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-mood-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

6monthsoutcomes-strokespecificQOL-strokeimpactscale-memory-MeanSD-physiotherapy >45 mins - 1 hour, 5 days per week-physiotherapy </=45 mins, 5 days per week-t6

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

Verheyden, 2009

Bibliographic Reference	Verheyden, G.; Vereeck, L.; Truijen, S.; Troch, M.; Lafosse, C.; Saeys, W.; Leenaerts, E.; Palinckx, A.; De Weerdt, W.; Additional exercises improve trunk performance after stroke: a pilot randomized controlled trial; Neurorehabilitation and Neural Repair; 2009; vol. 23 (no. 3); 281-6

Study details

Secondary publication of	NR

another included study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Belgium
Study setting	In patient rehabilitation
Study dates	September 2004 to April 2005
Sources of funding	NR
Inclusion criteria	Participants were recruited from the rehabilitation centre Hof ter Schelde (Antwerp, Belgium) if they attended the inpatient stroke rehabilitation program and had a hemiparesis that was stroke related. Stroke diagnosis was confirmed by the consultant appointed at the rehabilitation centre on the basis of CT or MRI imaging. Patients who suffered from an earlier stroke were only allowed in the study if they were fully recovered. In case of aphasia, patients' relatives were asked to give informed consent.
Exclusion criteria	Patients were excluded from the study if they were 80 years of age or older, were not able to understand the instructions, had other disorders that could affect motor performance, or obtained a maximum trunk performance score at the start of the study.
Recruitment / selection of participants	Participants were recruited from the rehabilitation center Hof ter Schelde (Antwerp, Belgium) if they attended the inpatient stroke rehabilitation program and had a hemiparesis that was stroke related.

Intervention(s)	In addition to the conventional treatment, patients from the experimental group received 30 minutes of extra training, 4 times a week, for 5 weeks. In total, 10 hours of additional training were given. The additional exercises consisted of selective movements of the upper and lower part of the trunk in supine and sitting. Supine exercises, with the legs bent and the feet resting on the treatment table, included selective anterior-posterior movements of the pelvis, extension of the hips (bridging), and rotation of the trunk initiated from the upper and lower part of the trunk. Exercises were gradually introduced and the number of repetitions was determined by the therapist on the basis of the patients' performance. Concomitant therapy; Patients in both groups received the conventional multidisciplinary stroke rehabilitation program provided by the rehabilitation centre. The conventional treatment program is patient-specific and consists mainly of physiotherapy, occupational therapy, and nursing care. Neuropsychological and speech therapy are provided if needed. Therapists combine elements from different neurological treatment concepts but the main emphasis is on the neurodevelopmental treatment concept and on motor relearning strategies.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Patients in the experimental and control groups received the conventional multidisciplinary stroke rehabilitation program provided by the rehabilitation center. The conventional treatment program is patient-specific and consists mainly of physiotherapy, occupational therapy, and nursing care. Neuropsychological and speech therapy are provided if needed. Therapists combine elements from different neurological treatment concepts but the main emphasis is on the neurodevelopmental treatment concept and on motor relearning strategies.
Number of participants	33
Duration of follow-up	5 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	intensity tailored to the individual

	hospital based therapy individual therapy
Additional comments	NR

Study arms

Physiotherapy </=45 mins, 4 days per week + usual care (N = 17)
In addition to the conventional treatment, patients from the experimental group received 30 minutes of extra training, 4 times a week, for 5 weeks. In total, 10 hours of additional training were given. The additional exercises consisted of selective movements of the upper and lower part of the trunk in supine and sitting.

physiotherapy usual care unknown intensity (N = 16)
Patients in the experimental and control groups received the conventional multidisciplinary stroke rehabilitation program provided by the rehabilitation centre. The conventional treatment program is patient-specific and consists mainly of physiotherapy, occupational therapy, and nursing care. Neuropsychological and speech therapy are provided if needed. Therapists combine elements from different neurological treatment concepts but the main emphasis is on the neuro developmental treatment concept and on motor relearning strategies.

Characteristics

Study-level characteristics

Characteristic	Study (N = 33)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	Physiotherapy </=45 mins, 4 days per week + usual care (N = 17)	physiotherapy usual care unknown intensity (N = 16)
% Female Nominal	35	44
Mean age (SD) Mean (SD)	55 (11)	62 (14)

Characteristic	Physiotherapy </=45 mins, 4 days per week + usual care (N = 17)	physiotherapy usual care unknown intensity (N = 16)
Time period since stroke Mean (SD)	53 (24)	49 (28)

Outcomes

Study timepoints

- Baseline
- 5 week

physiotherapy </45 min + usual care vs usual care

Outcome	Physiotherapy </=45 mins, 4 days per week + usual care, Baseline, N = 17	Physiotherapy </=45 mins, 4 days per week + usual care, 5 week, N = 17	physiotherapy usual care unknown intensity, Baseline, N = 16	physiotherapy usual care unknown intensity, 5 week, N = 16
Discontinuation No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0
physical function - trunk? - Trunk impairment scale 0-23 Mean (SD)	14.18 (3.76)	19 (2.78)	15.19 (5)	18.5 (3.12)

Discontinuation - Polarity - Lower values are better

physical function - trunk? - Trunk impairment scale - Polarity - Higher values are better

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

physiotherapy</45min+usualcarevsusualcare-Discontinuation-NoOfEvents-Physiotherapy </=45 mins, 4 days per week + usual care-physiotherapy usual care unknown intensity-t5

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

physiotherapy</45min+usualcarevsusualcare-physicalfunction-trunk?-Trunkimpairmentscale-MeanSD-Physiotherapy </=45 mins, 4 days per week + usual care-physiotherapy usual care unknown intensity-t5

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

Vloothuis, 2019

Bibliographic Reference	Vloothuis, J. D. M.; Mulder, M.; Nijland, R. H. M.; Goedhart, Q. S.; Konijnenbelt, M.; Mulder, H.; Hertogh, Cmpm; van Tulder, M.; van Wegen, E. E. H.; Kwakkel, G.; Caregiver-mediated exercises with e-health support for early supported discharge after stroke (CARE4STROKE): A randomized controlled trial; PLoS ONE [Electronic Resource]; 2019; vol. 14 (no. 4); e0214241

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	Vloothuis J, Mulder M, Nijland RHM, Konijnenbelt M, Mulder H, Hertogh CMPM, et al. Caregiver-mediated exercises with e-health support for early supported discharge after stroke (CARE4STROKE): Study protocol for a randomized controlled trial. BMC Neurology. 2015; 15(1). Vloothuis J, de Bruin J, Mulder M, Nijland R, Kwakkel G, van Wegen EEH. Description of the CARE4STROKE programme: A caregiver-mediated exercises intervention with e-health support for stroke patients. Physiotherapy research international: the journal for researchers and clinicians in physical therapy. 2018:e1719. Epub 2018/05/26. https://doi.org/10.1002/pri.1719 PMID: 29797740.
Trial name / registration number	CARE4STROKE
Study location	Netherlands
Study setting	Any rehabilitation setting, whether it is in a rehabilitation centre, hospital, nursing home, or the home environment. When patients are discharged during the intervention period, training can continue at home
Study dates	April 2014 and July 2016.
Sources of funding	This study was funded by the Netherlands Organization of Health Research and Development (ZonMW - www.zonmw.nl) grant number 837001408 (2013) and grant number 606300098012 (2015) Both grants were awarded to GK and EvW. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. AptaVivar provided support in the form of salary for author HM, but did not have any additional role in the study design, data

	collection and analysis, decision to publish, or preparation of the manuscript. The specific roles of this author are articulated in the ‘author contributions’ section.
Inclusion criteria	Patients were eligible if they (1) had a stroke according the WHO definition; (2) had lived independently before the stroke; (3) were planned to be discharged home; (4) were able to follow instructions (MMSE score > 18 points) (5) had a Functional Ambulation Score (FAC) < 5 and (6) were willing and able to appoint a caregiver who wanted to participate in the program (with a maximum of two caregivers). A caregiver was defined as someone close to the patient who was willing and able to do exercises together with the patient, for example a partner, family member or friend. This caregiver was not a professional and was not paid for his/her efforts. Patients were asked to appoint one or two preferred caregivers, thereafter inclusion criteria for the caregivers were checked. These inclusion criteria for the caregiver were: (1) being medically stable and (2) being physically able to perform the exercises together with the patient. Inclusion criteria for both patients and caregivers were (1) aged 18 years or older; (2) written informed consent; (3) ability to understand Dutch or English (at a sufficient level to understand instructions); (4) sufficiently motivated to participate in the caregiver-mediated exercise program; and (5) a score of <11 on the ‘depression’ domain of the Hospital Anxiety and Depression Scale (HADS).
Exclusion criteria	An exclusion criterion for both patients and caregivers was a serious comorbidity that interfered with mobility training, for example a severe cardiopulmonary illness or a disabling orthopaedic comorbidity of the lower extremity. To finally determine the suitability of patients and caregivers, an intake exercise session with a trained physical therapist was scheduled prior to inclusion. During this session the therapist judged if the patient-caregiver couple was able to exercise adequately and safely together.
Recruitment / selection of participants	After screening 1082 patients admitted on the neurological wards of the participating centers, 66 participants were recurited between April 2014 and July 2016.
Intervention(s)	The program consisted of 8 weeks of exercise therapy, executed with a caregiver, in addition to usual care following the current guidelines in the Netherlands. The exercise program was composed by a trained physical therapist during weekly sessions. The therapist could choose from 37 standardized exercises aimed at improving mobility, presented in an e-health application (‘app’). For each patient, exercises were combined into a patient-tailored, progressive training regimen, related to the patient goals. Patient-caregiver couples were encouraged to contact the coordinating therapist using tele-rehabilitation services like telephone, video conferencing or email when appropriate in between the weekly exercise sessions. The patients and their caregivers were instructed to perform the selected set of exercises at least five times a week for 30 minutes. This meant that patients received 20 hours of caregiver-mediated exercises in addition to usual care during the 8-week intervention period. When the patient’s discharge date fell before the anticipated end date of the

	CARE4STROKE intervention, the program was continued at home. All physical therapists were thoroughly trained in a training course, prior to delivering the CARE4STROKE program. Concomitant therapy; all participants received usual care according to the guidelines for physical therapy for patients with stroke of the Royal Dutch Society for Physical Therapy (KNGF). Therapy sessions are designed according to patient goals. Therefore, there were no restrictions with respect to content, time or duration of the physical therapy. Task and context specificity are important aspects of physical therapy after stroke. With that, in current guidelines, exercises are recommended to improve functional outcomes such as standing balance, physical condition, and walking competence.
Population subgroups	Physiotherapist/carer
Subgroup 1: Community-based vs. hospital-based	Mixed
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency

Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Mixed
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The participants in the control group received usual care according to the guidelines for physical therapy for patients with stroke of the Royal Dutch Society for Physical Therapy (KNGF). Therapy sessions are designed according to patient goals. Therefore, there were no restrictions with respect to content, time or duration of the physical therapy. Task and context specificity are important aspects of physical therapy after stroke. With that, in current guidelines, exercises are recommended to improve functional outcomes such as standing balance, physical condition, and walking competence.
Number of participants	66
Duration of follow-up	12 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	intensity tailored to individual

	Tele rehabilitation home based and hospital based self management support of family/caregivers Continuity of care
Additional comments	Data were analysed according to the intention-to-treat principle and the statistician was kept blinded for group allocation. Missing items were imputed using serial means. Missing values were not imputed if entire questionnaires or scales were missing.

Study arms

carer/telerehab </=45 mins per day, 5 days per week (N = 32)
the program consisted of 8 weeks of exercise therapy, executed with a caregiver, in addition to usual care. The patients and their caregivers were instructed to perform the selected set of exercises at least five times a week for 30 minutes. This meant that patients received 20 hours of caregiver-mediated exercises in addition to usual care during the 8-week intervention period.

physiotherapy usual care (N = 34)
usual care according to the guidelines for physical therapy for patients with stroke of the Royal Dutch Society for Physical Therapy (KNGF). Therapy sessions are designed according to patient goals. Therefore, there were no restrictions with respect to content, time or duration of the physical therapy. Task and context specificity are important aspects of physical therapy after stroke. With that, in

current guidelines, exercises are recommended to improve functional outcomes such as standing balance, physical condition, and walking competence.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 66)**
Ethnicity Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	**carer/telerehab </=45 mins per day, 5 days per week (N = 32)**	**physiotherapy usual care (N = 34)**
% Female Nominal	34	41
Mean age (SD) Mean (SD)	60.53 (14.82)	59.26 (15.01)
Comorbidities visuospatial neglect Nominal	10	9

Characteristic	carer/telerehab </=45 mins per day, 5 days per week (N = 32)	physiotherapy usual care (N = 34)
Time period since stroke days Mean (SD)	NR (NR)	*empty data*
Time period since stroke days Median (IQR)	36 (28 to 57)	37 (26 to 55)
Type of communication difficulty aphasia Nominal	8	6

Outcomes

Study timepoints

- Baseline
- 12 week

</= 45 mins physiotherapy + usual care vs usual care

Outcome	carer/telerehab </=45 mins per day, 5 days per week, Baseline, N = 32	carer/telerehab </=45 mins per day, 5 days per week, 12 week, N = 31	physiotherapy usual care , Baseline, N = 34	physiotherapy usual care , 12 week, N = 28
SIS - mobility 0-100	49.91 (24.17)	77.95 (21.44)	41.42 (20.45)	69.35 (20.81)

Outcome	carer/telerehab </=45 mins per day, 5 days per week, Baseline, N = 32	carer/telerehab </=45 mins per day, 5 days per week, 12 week, N = 31	physiotherapy usual care , Baseline, N = 34	physiotherapy usual care , 12 week, N = 28
Mean (SD)				
ADLs - Barthel Index 0-20 Mean (SD)	13.22 (3.97)	17.87 (3.3)	13.18 (3.96)	16.89 (3.47)
Stroke outcome - modified Rankin scale 0-5 Mean (SD)	3.78 (0.61)	2.23 (1.02)	3.68 (0.77)	2.44 (1.28)
physical function - rivermead mobility index 0-15 Mean (SD)	6.5 (3.31)	11.66 (3.26)	6.29 (2.93)	10.83 (3.61)
carer QOL 0-14 - could not find polarity Mean (SD)	11.69 (1.75)	10.52 (2.03)	12 (1.87)	10.96 (2.16)
Discontinuation control group = 1 died, 1 serious comorbidity, 3 not motivated No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 5 ; % = 14.71

SIS - mobility - Polarity - Higher values are better
ADLs - Barthel Index - Polarity - Higher values are better

Stroke outcome - modified Rankin scale - Polarity - Lower values are better
Discontinuation - Polarity - Lower values are better
final values

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

</=45minsphysiotherapy+usualcarevsusualcare-carerQOL-MeanSD-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

</=45minsphysiotherapy+usualcarevsusualcare-SIS-mobility-MeanSD-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

</=45minsphysiotherapy+usualcarevsusualcare-ADLs-BarthelIndex-MeanSD-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

</=45minsphysiotherapy+usualcarevsusualcare-Strokeoutcome-modifiedRankinscale-MeanSD-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

</=45minsphysiotherapy+usualcarevsusualcare-Discontinuation-NoOfEvents-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

</=45minsphysiotherapy+usualcarevsusualcare-physicalfunction-rivermeadmobilityindex-MeanSD-carer/telerehab </=45 mins per day, 5 days per week-physiotherapy usual care -t12

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

Wall, 2020

Bibliographic Reference	Wall, A.; Borg, J.; Vreede, K.; Palmcrantz, S.; A randomized controlled study incorporating an electromechanical gait machine, the Hybrid Assistive Limb, in gait training of patients with severe limitations in walking in the subacute phase after stroke; PLoS ONE [Electronic Resource]; 2020; vol. 15 (no. 2); e0229707

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	The study was registered at ClinicalTrials.gov Identifier: NCT02410915, https:// clinicaltrials.gov/ct2/show/NCT02410915. Registration was published in April 2015 after start of enrolment since registration was not part of the research routine at our department prior to this date. The authors confirm that all ongoing and related studies by our study group for this intervention are registered
Study location	University Department of Rehabilitation Medicine at Danderyd Hospital, Stockholm, Sweden
Study setting	inpatient rehabilitation unit
Study dates	February 2014 and December 2016, with the last follow-up performed in May 2017.
Sources of funding	Funding: This work was supported with grants from the Promobilia Foundation (16096, 17097, 17066) (AW), STROKE-Riksforbundet (na)(AW), NEURO Sweden (na) (AW), the Norrbacka-Eugenia Foundation (865/16) (AW), and a donation by Lars Hedlund (Karolinska Institutet Dnr 2-1582/2016) (JB). HAL suits were provided by Cyberdyne Inc., Japan. The study sponsors were not involved in the study design, data collection, analysis and interpretation of data, in writing the manuscript, or in the decision to submit the manuscript for publication
Inclusion criteria	Eligible patients were those who underwent team based, inpatient rehabilitation in the sub-acute stage after stroke. Inclusion criteria were <8 weeks since onset of ischemic or hemorrhagic stroke (verified by CT and/or MRI); inability to walk or in need of continuous manual support to walk due to lower extremity paresis (i.e. Functional Ambulation Categories (FAC) score 0–1); the ability to maintain a sitting posture with or without supervision for >5 minutes and, sufficient postural control to allow upright position in standing with aids and/or manual support; cognitive ability to understand training instructions as well as written and oral study information and express informed consent; and a body size compatible with the HAL suits
Exclusion criteria	Exclusion criteria were cerebellar stroke, primary subarachnoid bleeding, contracture restricting gait movements at any lower limb joint, cardiovascular or other somatic condition incompatible with intensive gait training, and/or severe contagious infections.
Recruitment / selection of participants	The recruitment period lasted between February 2014 and December 2016, with the last follow-up performed in May 2017. All participants in this study expressed informed consent.
Intervention(s)	Training was performed using the single-leg version of HAL 4 days per week for 4 weeks (16 sessions in total). All sessions were conducted on a treadmill in combination with BWS and with one or two physiotherapists, educated in the HAL system, present. Patients were encouraged to continue walking as far as possible, but at most for 60 minute’s effective gait training

	time. Each session could at most proceed for 90 minutes, including time for putting on and taking off the suit, the gait training, and pauses at patients' request. The physiotherapists provided feedback through verbal instruction and/or by placing a mirror in front of the patients during the sessions. The settings were individually adapted as the training progressed and optimized based on continuous observational gait analysis in order to achieve a gait pattern as close to normal gait as possible (i.e. avoiding compensatory movements such as circumduction). During the first session, BWS was set to 30% of the participant's weight, and training was performed using the CAC mode at both the hip and knee joint. The initial speed of the treadmill was individually adjusted but started at lowest with a speed of 0.5 km/h. As the participants improved in walking ability, the amount of BWS and assistance was reduced, and the treadmill speed increased based on the physiotherapist's continuous observations. As in conventional gait training the HAL training was set to be challenging and not more assistance than needed was provided. All HAL sessions were documented using a standardized protocol, including the individual settings and training performance. After finishing the intervention period, the conventional team-based, individually adapted training program continued until discharge. Concomitant therapy; Study group allocation was not planned to affect other team-based interventions. Conventional team-based training was evidence based, individualized, and performed according to current best practice for inpatient rehabilitation after stroke on weekdays, 5 days/week. The conventional team-based training was offered to both study groups, included physiotherapy training, most often daily for 30–60 minutes, and comprised e.g. training of motor function in the upper and lower extremity, trunk control, transferring oneself, and gait.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated	Moderate (or NIHSS 5-14)

by category or as measured by NIHSS scale)	
Subgroup 4: Focus of care	Lower limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Not stated/unclear
Subgroup 8: Professional providing care	Physiotherapists
Comparator	Conventional team-based training was evidence based, individualized, and performed according to current best practice for inpatient rehabilitation after stroke on weekdays, 5 days/week. The conventional team-based training was offered to both study groups, included physiotherapy training, most often daily for 30–60 minutes, and comprised e.g. training of motor function in the upper and lower extremity, trunk control, transferring oneself, and gait. The CGT could include standing, weight shifting, stepping, over-ground walking with manual assistance and/or assistive devices (such as walking aids and braces) as well as the use of a treadmill with/without BWS. Study group allocation was not planned to affect other team-based interventions. Physiotherapy sessions including CGT were documented by the patient's team physiotherapist in the patient's medical record regarding type of gait training and estimated time and distance walked.
Number of participants	33

Duration of follow-up	6 months
Indirectness	NR
Elements of the study relating to qualitative themes	intensity adapted to the individual supervision of therapists hospital based individual therapy use of expensive equipment
Additional comments	NR

Study arms

physiotherapy > 1-2 hours, 4 days (N = 17)
Hybrid assistive limb gait training (HAL). raining was performed using the single-leg version of HAL 4 days per week for 4 weeks (16 sessions in total). All sessions were conducted on a treadmill in combination with BWS and with one or two physiotherapists, educated in the HAL system, present. Patients were encouraged to continue walking as far as possible, but at most for 60 minute's effective gait training time. Each session could at most proceed for 90 minutes, including time for putting on and taking off the suit, the gait training, and pauses at patients' request. Conventional team-based training was evidence based, individualized, and performed according to current best practice for inpatient rehabilitation after stroke on weekdays, 5 days/week. The conventional team-based training was offered to both study groups, included physiotherapy training, most often daily for 30–60 minutes, and comprised e.g. training of motor function in the upper and lower extremity, trunk control, transferring oneself, and gait.

Conventional inpatient rehabilitation after stroke - 5 days per week for 30-60 mins (N = 16)
Conventional team-based training was evidence based, individualized, and performed according to current best practice for inpatient rehabilitation after stroke on weekdays, 5 days/week. The conventional team-based training was offered to both study groups, included physiotherapy training, most often daily for 30–60 minutes, and comprised e.g. training of motor function in the upper and lower extremity, trunk control, transferring oneself, and gait.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 33)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR

Characteristic	Study (N = 33)
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy > 1-2 hours, 4 days (N = 17)	Conventional inpatient rehabilitation after stroke - 5 days per week for 30-60 mins (N = 16)
% Female Nominal	3	19
Mean age (SD) Median (IQR)	55 (48.25 to 62.5)	57.5 (54.25 to 60.75)
Severity Median (IQR)	11.5 (8.25 to 14.5)	13 (10 to 18)
Time period since stroke (days) Mean (SD)	32 (15)	36 (16)

Outcomes

Study timepoints

- Baseline
- 6 month

additional hybrid assisted limb therapy vs conventional rehabilitation

Outcome	physiotherapy > 1-2 hours, 4 days, Baseline, N = 16	physiotherapy > 1-2 hours, 4 days, 6 month, N = 16	Conventional inpatient rehabilitation after stroke - 5 days per week for 30-60 mins, Baseline, N = 16	Conventional inpatient rehabilitation after stroke - 5 days per week for 30-60 mins, 6 month, N = 14
Discontinuation experimental group = 1 lost to medical reasons. control group = 1 lost to medical reasons, 1 lost to personal reasons No of events	n = 0 ; % = 0	n = 1 ; % = 6.25	n = 0 ; % = 0	n = 2 ; % = 12.5

Discontinuation - Polarity - Lower values are better

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

additionalhybridassistedlimbtherapyvsconventionalrehabilitation-Discontinuation-NoOfEvents-physiotherapy > 1-2 hours, 4 days-Conventional inpatient rehabilitation after stroke - 5 days per week for 30-60 mins-t6

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(drop outs may be due to knowledge of intervention)*
Overall bias and Directness	Overall Directness	Directly applicable

Winstein, 2004

Bibliographic Reference	Winstein, C. J.; Rose, D. K.; Tan, S. M.; Lewthwaite, R.; Chui, H. C.; Azen, S. P.; A randomized controlled comparison of upper-extremity rehabilitation strategies in acute stroke: A pilot study of immediate and long-term outcomes; Archives of Physical Medicine & Rehabilitation; 2004; vol. 85 (no. 4); 620-8

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	Nr
Trial name / registration number	NR
Study location	USA
Study setting	inpatient and outpatient rehabilitation setting
Study dates	NR
Sources of funding	Supported in part by the national institute of child health and human development, national institutes of health, and the foundation for physical therapy.

	no commercial party had a direct financial interest in the results of the research supporting this article, had or will confer a benefit upon the authors or upon any organisation with which the authors are associated.
Inclusion criteria	eligibility criteria included first time stroke from infarction in the anterior circulation confirmed by a MRI or CT scan, onset of stroke from 2-35 days before study entry, and a FIM instruments total score at admission of 40 to 80. Early in the recruitment progress the inclusion criteria was broadened to include patients with haemorrhagic or pontine stroke and a wider range of admission FIM score.
Exclusion criteria	Participants were excluded if they have peripheral nerve or orthopaedic conditions that interfered with arm movement, had a cardiac disease that limited function by exertional dyspnoea, angina, or severe fatigue, of had subarachnoid haemorrhage without evidence of infarction, progressive hydrocephalus, previous history of brain injury, or severe aphasia, neglect, agitation, or depression that could limit participation.
Recruitment / selection of participants	Participants between the ages of 29 and 76 years were recruited from the nuero-rehabilitation service at Rancho Los Amigos National rehabilitation centre in Downey, CA.
Intervention(s)	Combined the two treatment arms for the purposes of this review task specific functional training plus standard care and motor control plus standard care. Task specific functional training focused on the systemic and repetitive practice of tasks that could be performed within the level of available voluntary motion. tasks were progressively arranged and customised to account for any unique recovery patterns of reaching and grasping. All tasks were repeatable and had some functional goal (e.g. pointing, grasping, stirring). The principles of motor learning were applied as the physical therapists systematically provided knowledge of results and progressed task difficulty to keep the participants challenged, motivated and engaged. Strengthening and motor control training used resistance to available arm motion to increase strength. Exercises were performed using either eccentric, isometric or concentric muscle contractions and concentric exercises were performed in a

	gravity-lessened position or against gravity if possible. Exercises were progressed and progression of exercises used a protocol of high intensity progressive resistance training of shoulder, elbow, wrist and hand motions. this strengthening programme was implemented on alternate days for 3 days a week. On other days the same exercises were performed with less resistance and greater speeded. physical therapists systematically provided knowledge of results (eg, load, number of repetitions) during the therapy. Concomitant therapy; Standard care was provided to both groups in addition to the above. standard care for the upper extremity was delivered primarily by occupational therapists and could include muscle facilitation exercises, empathising the neurodevelopmental treatment approach, neuromuscular electric stimulation applied primarily for shoulder subluxation, stretching exercises, activities of daily living including self-care where the upper lime was used as an assist if appropriate, and caregiver training. 1 hour of either therapy plus standard care for 5 days per week lasting 4 weeks. 20 hours full dose of therapy.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	physiotherapists and OTs
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)

Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Other Physiotherapists and OTs
Comparator	Standard care alone was provided to the control group. Standard care for the upper extremity was delivered primarily by occupational therapists and could include muscle facilitation exercises, empathising the neurodevelopmental treatment approach, neuromuscular electric stimulation applied primarily for shoulder subluxation, stretching exercises, activities of daily living including self-care where the upper limb was used as an assist if appropriate, and caregiver training. No details of intensity or dose were provided.

Number of participants	45
Duration of follow-up	6 weeks and 9 months
Indirectness	NR
Elements of the study relating to qualitative themes	Feedback - feedback from therapists on results to motivate participants motivation - feedback provided by therapists increased motivation intensity tailored to individual needs - programme tailored to the individual needs More therapy is better - authors conclude that the essential therapeutic element in the short term FU period was the extra round (20h) of therapy and not the content of therapy (function vs strength) that was important. hospital based individual therapy
Additional comments	NR

Study arms

physiotherapy >1-2 hours per day, 5 days per week (N = 43)
Combined the 2 treatment arms of task specific functional training plus standard care and strengthening and motor control training plus standard care. 1 hour of either therapy plus standard care for 5 days per week lasting 4 weeks. 20 hours full dose of therapy.

standard care (N = 21)
Standard care alone was provided to the control group. Standard care for the upper extremity was delivered primarily by occupational therapists and could include muscle facilitation exercises, empathising the neurodevelopmental treatment approach, neuromuscular electric stimulation applied primarily for shoulder subluxation, stretching exercises, activities of daily living including self-care where the upper limb was used as an assist if appropriate, and caregiver training. no details on dose were provided.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 60)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy >1-2 hours per day, 5 days per week (N = 43)	standard care (N = 21)
% Female Nominal	47	40
Mean age (SD) Nominal	NR	NR
<35 years Nominal	0	2
35-75 years Nominal	39	18
>75 years Nominal	1	0
Time period since stroke (days) Mean (SD)	16.4 (8.7)	15.4 (5.5)

Outcomes

Study timepoints

- Baseline
- 6 week (post intervention outcome)
- 9 month

6 week and 9 month change scores

Outcome	physiotherapy >1-2 hours per day, 5 days per week, Baseline, N = 40	physiotherapy >1-2 hours per day, 5 days per week, 6 week, N = 40	physiotherapy >1-2 hours per day, 5 days per week, 9 month, N = 29	standard care, Baseline, N = 20	standard care, 6 week, N = 20	standard care, 9 month, N = 15
physical function -upper limb - fugl-meyer ROM Mean (SD)	23.1 (1.9)	-1.33 (2.07)	-1.38 (2.94)	23.25 (1.21)	-0.6 (1.93)	-0.33 (1.45)
physical function -upper limb - fugl-meyer Pain Mean (SD)	22 (2.8)	-1.15 (2.57)	-1.21 (3.33)	22.4 (2.5)	-0.6 (1.79)	-1 (2.88)
physical function -upper limb - fugl-meyer Sensory Mean (SD)	9.1 (3.9)	1.03 (2.62)	0.45 (1.64)	9.95 (3.65)	0.75 (1.33)	0.07 (1.03)
physical function -upper limb - fugl-meyer Motor function Mean (SD)	19.3 (18.1)	17.35 (13.49)	5.55 (7.29)	23.55 (22.31)	9.05 (7.6)	8.33 (11.26)
Discontinuation treatment group = 11 moved away/lost contact, 2 lost interest, 1 admitted to hospital with medical complications. control = 5 moved away/lost contact, 1 admitted to hospital with medical complications No of events	n = 0 ; % = 0	n = 1 ; % = 4.76	n = 6 ; % = 28.57	n = 0 ; % = 0	n = 3 ; % = 6.98	n = 14 ; % = 32.56

Discontinuation - Polarity - Lower values are better

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

6weekand9monthchangescores-Discontinuation-NoOfEvents-physiotherapy >1-2 hours per day, 5 days per week-standard care-t6

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

6weekand9monthchangescores-Discontinuation-NoOfEvents-physiotherapy >1-2 hours per day, 5 days per week-standard care-t9

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerROM-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t6

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerPain-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t6

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerSensory-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t6

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerMotorfunction-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t6

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerROM-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t9

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerPain-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t9

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerSensory-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t9

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

6weekand9monthchangescores-physicalfunction-upperlimb-fugl-meyerMotorfunction-MeanSD-physiotherapy >1-2 hours per day, 5 days per week-standard care-t9

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

Woldag, 2017

Bibliographic Reference	Woldag, H.; Voigt, N.; Bley, M.; Hummelsheim, H.; Constraint-Induced Aphasia Therapy in the Acute Stage: What Is the Key Factor for Efficacy? A Randomized Controlled Study; Neurorehabilitation & Neural Repair; 2017; vol. 31 (no. 1); 72-80

Study details

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

Study location	Germany
Study setting	stroke rehabilitation centre - inpatient
Study dates	NR
Sources of funding	The authors received no financial support for the research, authorship, and/or publication of this article
Inclusion criteria	A total of 86 patients with aphasia were screened to be eligible for study inclusion. The screening was done using the AAT subtest focusing on spontaneous speech (value range = 0-5). Patients had to attain values between 1 and 4.
Exclusion criteria	Exclusion criteria were severe cognitive or attentional impairments, severe depression, left-handedness, severe dysarthria, apraxia of speech, severe deafness, and additional neurological diseases affecting speech (eg, Parkinson's disease).
Recruitment / selection of participants	A total of 86 patients with aphasia were screened to be eligible for study inclusion.
Intervention(s)	Both intervention groups have been combined for the purposes of this review as both received the same intensity pf therapy. Constraint induced aphasia therapy - Patients in the CIAT arm of the study received 3 hours of CIAT therapy per day over a span of 10 workdays (30 training hours total) as group therapy. The CIAT therapy group consisted of 2 to 3 patients and 2 speech therapists who engaged with one another using the following card game: A deck of 15 to 20 identical card pairs containing pictures of everyday items, situations, or people was distributed randomly among the patients, all the while ensuring that each patient held only 1 card of the available pair. With patients visually isolated from one another by a wooden barrier, the participants were then prompted to engage with their fellow players through spoken communication only, the ultimate goal being to obtain the corresponding card of the pair from the other player(s). Whereas one therapist joined the patients in playing the game, the other observed the group, ensuring that rules were abided by, no compensatory communication mechanisms were being used, and cueing patients when necessary. Shaping elements were introduced into game play by forcing patients to include increasingly complex verbal structures into their respective interactions with one another, including but not limited to the names of the other players, polite phrases, and so on. In addition to the standard CIAT shaping mechanisms mentioned above, additional shaping elements were introduced by using playing cards

	with increasingly complex pictures, which were, for example, distinguishable solely by colour, number of identical items, and so on. The second arm of the study included patients who were in a conventional communication treatment group (CTG), a therapeutic approach vastly different from that of CIAT. Although the intensity of the therapy remained the same (3 h/d over a span of 10 workdays, totalling 30 training hours), several key aspects contributed to a different therapeutic approach. CTG consisted of 3 to 4 patients and 1 speech therapist, interacting with one another in such a way as to allow all types of communication, including mutual support and other forms of aid, without constraint. This type of therapy was individualized to each patient's particular deficit, all the while keeping the principle of shaping in mind. The content of CTG was varied, with possible topics encompassing sentence completion, listening and repeating, conversation about current events, following instructions, written language training (phoneme-grapheme conversion), and word retrieval. Concomitant therapy; none
Population subgroups	SALT
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Communication
Subgroup 5: Type of communication difficulty	Aphasia
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Speech and Language Therapists
Comparator	The control group (CG) received a clinic-typical therapeutic approach, which includes evidence-based SLT and is commonly used and widely accepted in neurological rehabilitation centres. Although it has only been evaluated empirically and never in a controlled study, its use in the third arm of this study was mainly of importance in controlling therapeutic intensity. Therapy in the CG consisted of 30 minutes of individual therapy twice a day over a span of 10 workdays (10 hours) and 1 hour of group therapy 4 times within a time span of 2 weeks (a total of 14 training hours). Whereas the content of the individual therapy was adapted to fit each patient’s unique needs in a deficit-focused manner, group therapy was administered in the same way as described above for CTG. Both forms of therapy, individual and group, addressed all communication modalities under the strict consideration of the shaping principle.
Number of participants	62
Duration of follow-up	2 weeks

Indirectness	NR
Elements of the study relating to qualitative themes	group therapy individualised therapy in control group hospital based
Additional comments	NR

Study arms

SALT >2-4 hours, 5 days per week (N = 42)
Patients in the CIAT arm of the study received 3 hours of CIAT therapy per day over a span of 10 workdays (30 training hours total) as group therapy. The CIAT therapy group consisted of 2 to 3 patients and 2 speech therapists who engaged with one another using a card game. The second arm of the study included patients who were in a conventional communication treatment group (CTG), a therapeutic approach vastly different from that of CIAT. Although the intensity of the therapy remained the same (3 h/d over a span of 10 workdays, totalling 30 training hours), several key aspects contributed to a different therapeutic approach. CTG consisted of 3 to 4 patients and 1 speech therapist, interacting with one another in such a way as to allow all types of communication, including mutual support and other forms of aid, without constraint. Both groups have been combined for this review as they use the same intensity of therapy

SALT >1-2 hours, 5 days per week (N = 20)
The control group (CG) received a clinic-typical therapeutic approach, which includes evidence-based SLT and is commonly used and widely accepted in neurological rehabilitation centers. Although it has only been evaluated empirically and never in a controlled study,

its use in the third arm of this study was mainly of importance in controlling therapeutic intensity. Therapy in the CG consisted of 30 minutes of individual therapy twice a day over a span of 10 workdays (10 hours) and 1 hour of group therapy 4 times within a time span of 2 weeks (a total of 14 training hours). Whereas the content of the individual therapy was adapted to fit each patient's unique needs in a deficit-focused manner, group therapy was administered in the same way as described above for CTG. Both forms of therapy, individual and group, addressed all communication modalities under the strict consideration of the shaping principle. total therapy = 1 hour 24 mins, 5 days per week

Characteristics

Study-level characteristics

Characteristic	**Study (N = 60)**
Mean age (SD) Mean (SD)	68.2 (11.6)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	SALT >2-4 hours, 5 days per week (N = 42)	SALT >1-2 hours, 5 days per week (N = 20)
% Female Nominal	67	45
Time period since stroke (days) Mean (SD)	20.25 (10.5)	16.3 (6.2)

Outcomes

Study timepoints

- Baseline
- 2 week

2 week outcomes - change scores

Outcome	SALT >2-4 hours, 5 days per week, Baseline, N = 42	SALT >2-4 hours, 5 days per week, 2 week, N = 40	SALT >1-2 hours, 5 days per week, Baseline, N = 20	SALT >1-2 hours, 5 days per week, 2 week, N = 20
impairment specific measures - auditory compensation -Aachen Aphasia Test - Token Test (unclear scale) change score Mean (95% CI)	NA (NA to NA)	NA (NA to NA)	NA (NA to NA)	2.6 (1 to 4.3)
impairment specific measures - auditory compensation -Aachen Aphasia Test - Token	50.3 (8.8)	3.75 (5.71)	47.6 (7.7)	2.6 (3.76)

Outcome	SALT >2-4 hours, 5 days per week, Baseline, N = 42	SALT >2-4 hours, 5 days per week, 2 week, N = 40	SALT >1-2 hours, 5 days per week, Baseline, N = 20	SALT >1-2 hours, 5 days per week, 2 week, N = 20
Test (unclear scale) change score Mean (SD)				
Discontinuation 1 lost to FU due to attention deficit and 1 lost to FU due to epileptic seizure No of events	n = NA ; % = NA	n = 2 ; % = 4.76	n = NA ; % = NA	n = 0 ; % = 0
Communication - impairment specific measures (naming) -Aachen Aphasia Test - Naming unclear Mean (SD)	48.5 (7.9)	3.5 (5.8)	43.4 (8.8)	4 (4.11)

Discontinuation - Polarity - Lower values are better
2 week outcomes - results converted from mean (CI) to mean (SE) to mean (SD) so 2 treatment arms can be combined

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

2weekoutcomes-Discontinuation-NoOfEvents-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t2

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

2weekoutcomes-changescores-Functionalcommunication??-AachenAphasiaTest-Naming-MeanSD-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t2

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

2weekoutcomes-changescores-impairmentspecificmeasures-auditorycompensation-AachenAphasiaTest-TokenTest-MeanSD-SALT >2-4 hours, 5 days per week-SALT >1-2 hours, 5 days per week-t2

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

Wolf, 2006

Bibliographic Reference	Wolf, Sl; Winstein, Cj; Miller, Jp; Taub, E; Uswatte, G; Morris, D; Giuliani, C; Light, Ke; Nichols-Larsen, D; Effect of constraint-induced movement therapy on upper extremity function 3 to 9 months after stroke: the EXCITE randomized clinical trial; Journal - American Medical Association; 2006; vol. 296 (no. 17); 2095-104.

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	EXCITE trial. Clinicaltrials.gov = NCT00057018.
Study location	Multisite clinical trial conducted at 7 US academic institutions. USA
Study setting	Multisite clinical trial conducted at 7 US academic institutions.
Study dates	Between January 2001 and January 2003
Sources of funding	This research was supported by National Institutes of Health grant HD 37606 from the National Center for Medical Rehabilitation Research (National Institute of Child Health and Human Development) and the National Institute of Neurological Diseases and Stroke.
Inclusion criteria	experienced a stroke in the previous 3 to 9 months. Participants had a first-time clinical ischemic or haemorrhagic cerebrovascular accident, as ascertained from neuroimages or written medical reports during the screening procedure, and met either higher- or lower-functioning motor criteria derived from Wolf and Binder-Macleod18 and Taub et al.19 Higher-functioning participants demonstrated at least 20° of wrist extension and at least 10° of active extension of each metacarpophalangeal and interphalangeal joint of all digits. Lower-functioning participants had at least 10° of active wrist extension, at least 10° of thumb abduction/extension, and at least 10° of extension in at least 2 additional digits. These

	movements had to be repeated 3 times in 1 minute.19 Participants also had to demonstrate adequate balance while wearing the restraint and transferring to and from the toilet independently, ability to stand from a sitting position, and ability to stand for at least 2 minutes with or without upper extremity support. Additional range of motion and inclusion criteria, as well as information on other neuromuscular and functional measures, including the modified Ashworth spasticity scale, Fugl-Meyer Assessment scale, and time to turn 360°, were also assessed.
Exclusion criteria	Potential participants were excluded if they scored less than 24 on the Mini-Mental State Examination20 or if physician-determined major medical problems could interfere with participation. Additional exclusion criteria were previously clinically documented stroke, excessive pain in any joint of the paretic extremity, age younger than 18 years, insufficient stamina to participate, substantial use of the paretic arm in daily life as determined by a score of 2.5 or higher on the Motor Activity Log (MAL; described below), or previous participation in other pharmacologic or physical intervention studies.16 Participants were permitted to undergo other forms of physical or occupational therapy, exclusive of CIMT, prior to or after receiving CIMT
Recruitment / selection of participants	Individuals were recruited from 247 facilities spanning the 7 participating sites: 40 from Emory University; 39 from University of Alabama at Birmingham; 39 from University of Florida, Gainesville; 29 from Ohio State University, Columbus; 42 from University of Southern California, Los Angeles; 18 from University of North Carolina at Chapel Hill; and 15 from Wake Forest University, Winston Salem, NC.
Intervention(s)	Participants in the intervention group were taught to apply an instrumented protective safety mitt and encouraged to wear it on their less-impaired upper extremity for a goal of 90% of their waking hours over a 2-week period, including 2 weekends, for a total of 14 days. On each weekday, participants received shaping (adaptive task practice) and standard task training of the paretic limb for up to 6 hours per day. The former is based on the principles of behavioural training that can also be described in terms of motor learning derived from adaptive or part-task practice. Standard task practice is less structured (i.e. repetition of tasks is not conducted as individual trials of discrete movements); it involves functional activities performed continuously for a period of 15 to 20 minutes (eg, eating, writing). After completing each treatment, participants were encouraged to practice 2 to 3 tasks daily at home. Adherence to the extra laboratory treatment components was monitored regularly via a physical sensor and timer placed in the mitt and by a home diary. In the few occasions when patient home diary reports did not match outputs from the mitt monitoring device, participants were informed of the discrepancy and accurate reports resulted thereafter. Malfunctions in the monitoring device rarely occurred, but such devices were replaced immediately. Participants were encouraged to perform about 30 minutes of task practice daily following completion of the intervention period.

	Concomitant therapy; Usual and customary care. Usual and customary care ranged from no treatment to the application of mechanical interventions (orthotics) or various occupational and physical therapy approaches in the home, day treatment programs, or outpatient hospital visits. After completing each treatment, participants were encouraged to practice 2 to 3 tasks daily at home.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control condition was usual and customary care. Because this care might affect functional gains among participants, an attempt was made to track care received through participant reports collected during monthly phone calls by project staff and during the scheduled testing sessions. Usual and customary care ranged from no treatment to the application of mechanical interventions (orthotics) or various occupational and physical therapy approaches in the home, day treatment programs, or outpatient hospital visits. Participants in the control condition were offered the same CIMT regimen after the 12-month evaluation session. After completing each treatment, participants were encouraged to practice 2 to 3 tasks daily at home.
Number of participants	222
Duration of follow-up	12 months
Indirectness	NR
Elements of the study relating to qualitative themes	CIMT hospital based and home based practice individual therapy

Additional comments	NR

Study arms

CIMT physiotherapy >4 hours, 5 days per week (N = 106)
On each weekday, participants received shaping (adaptive task practice) and standard task training of the paretic limb for up to 6 hours per day for 2 weeks

Usual and customary care (N = 116)
Usual and customary care ranged from no treatment to the application of mechanical interventions (orthotics) or various occupational and physical therapy approaches in the home, day treatment programs, or outpatient hospital visits.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 222)**
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	CIMT physiotherapy >4 hours, 5 days per week (N = 106)	Usual and customary care (N = 116)
% Female Nominal	37	43
Mean age (SD) Mean (SD)	61 (13.5)	63.3 (12.6)
Ethnicity white Nominal	71	86
African-American Nominal	28	23
Comorbidities number of comorbidities Nominal	NR	NR
Comorbidities number of comorbidities Mean (SD)	1.9 (1.4)	1.8 (1.4)
arthritis Nominal	24	25
astthma Nominal	3	8

Characteristic	CIMT physiotherapy >4 hours, 5 days per week (N = 106)	Usual and customary care (N = 116)
Cancer Nominal	11	9
chest pain Nominal	10	14
Diabetes Nominal	30	20
previous fracture Nominal	22	24
Hypertension Nominal	73	73
heart diesease Nominal	10	16
previous myocardial infarction Nominal	10	8
osteoporosis Nominal	2	1
Seizures Nominal	6	5

Characteristic	CIMT physiotherapy >4 hours, 5 days per week (N = 106)	Usual and customary care (N = 116)
Time period since stroke (days) Mean (SD)	179.8 (66.1)	187.7 (70.8)

Outcomes

Study timepoints

- Baseline
- 2 week (post treatment)
- 12 month

CIMT 6 hours per day vs usual care

Outcome	CIMT physiotherapy >4 hours, 5 days per week, Baseline, N = 106	CIMT physiotherapy >4 hours, 5 days per week, 2 week, N = 106	CIMT physiotherapy >4 hours, 5 days per week, 12 month, N = 106	Usual and customary care, Baseline, N = 116	Usual and customary care, 2 week, N = 116	Usual and customary care, 12 month, N = 116
Discontinuation 2 weeks: CIMT = 5 withdrew, 1 moved, 1 stroke, 1 poor health. Usual care = 7 withdrew, 2 moved, 2 died. 12 months: CIMT = 11 withdrew, 3 deteriorating, 3 stroke, 3 poor health, 2 died. Control: 18 withdrew, 5 deteriorating, 3 moved, 4 died.	NR	8	23	NR	11	30

Outcome	CIMT physiotherapy >4 hours, 5 days per week, Baseline, N = 106	CIMT physiotherapy >4 hours, 5 days per week, 2 week, N = 106	CIMT physiotherapy >4 hours, 5 days per week, 12 month, N = 106	Usual and customary care, Baseline, N = 116	Usual and customary care, 2 week, N = 116	Usual and customary care, 12 month, N = 116
Nominal						

Discontinuation - Polarity - Lower values are better

difference between groups at 12 months

Outcome	CIMT physiotherapy >4 hours, 5 days per week vs Usual and customary care, Baseline vs 12 month, N2 = 222, N1 = 166
physical function - WMFT - Log performance time Mean (95% CI)	0.3 (0.04 to 0.57)
Person/participant generic health-related quality of life (Stroke Impact Scale) Scale range: Unclear. Change scores. Mean (95% CI)	NA (NA to NA)
Stroke Impact Scale Hand Function Mean (95% CI)	7.04 (-0.6 to 14.66)
Stroke Impact Scale Physical Function Mean (95% CI)	1.14 (-4.86 to 7.18)

physical function - WMFT - Log performance time - Polarity - Higher values are better

Person/participant generic health-related quality of life (Stroke Impact Scale) - Polarity - Higher values are better

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

CIMT6hoursperdayvsusualcare-Adverseevents-Nominal-CIMT physiotherapy 6 hours per day for 2 weeks-Usual and customary care-t12

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

differencebetweengroupsat12months-physicalfunction-WMFT-Logperformancetime-MeanNineFivePercentCI-CIMT physiotherapy >4 hours, 5 days per week-Usual and customary care-t12-vs-tBaseline

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

differencebetweengroupsat12months-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScale)-StrokeImpactScaleHandFunction-MeanNineFivePercentCI-CIMT physiotherapy >4 hours, 5 days per week-Usual and customary care-t12-vs-tBaseline

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

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable

differencebetweengroupsat12months-Person/participantgenerichealth-relatedqualityoflife(StrokeImpactScale)-StrokeImpactScalePhysicalFunction-MeanNineFivePercentCI-CIMT physiotherapy >4 hours, 5 days per week-Usual and customary care-t12-vs-tBaseline

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

CIMT6hoursperdayvsusualcare-Discontinuation-Nominal-CIMT physiotherapy >4 hours, 5 days per week-Usual and customary care-t2

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

Yadav, 2016

Bibliographic Reference	Yadav, R. K.; Sharma, R.; Borah, D.; Kothari, S. Y.; Efficacy of Modified Constraint Induced Movement Therapy in the Treatment of Hemiparetic Upper Limb in Stroke Patients: A Randomized Controlled Trial; Journal of Clinical and Diagnostic Research JCDR; 2016; vol. 10 (no. 11); YC01-YC05

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	India
Study setting	Outpatient Department of Physical Medicine and Rehabilitation at VMMC and Safdarjung Hospital
Study dates	October 2010 to April 2012.
Sources of funding	NR
Inclusion criteria	Post stroke hemiparetic patients of two months to two years duration with spasticity ≤ Grade -3 on modified Ashworth scale and those patients capable of extension of at least 10º each at Metacarpophalangeal (MCP), Proximal Interphalangeal (PIP) and Distal Interphalangeal (DIP) joints and 20º at wrist joint were recruited.
Exclusion criteria	Patients with history of previous stroke, angina, uncontrolled hypertension, on medication that could impair neuromuscular performance, with wrist or finger pathologies, significant visual or hearing impairment, balance problems which may compromise safety during sound upper limb constraint, and those unwilling to participate in the study were excluded from the study

Recruitment / selection of participants	NR
Intervention(s)	The study group participated in a modified CIMT programme in addition to the conventional rehabilitation programme. Patients in this group were asked to do activities of either mCIMT or conventional rehabilitation programme on a particular day. Therapy sessions during mCIMT concentrated on affected limb use, in functional tasks like reaching forward to hold a glass and drinking from it, picking up a comb and combing hair, turning on and off a light switch, buttoning and unbuttoning of clothes, writing with a pen. This was done for three hours in a day alternatively for three days a week. A constraint session of the unaffected limb was also used for five hours per day for five days a week. For the constraint session the patient's unaffected hand and wrist was covered with a mitt during times of frequent arm use and during activities of mCIMT. The total duration of intervention was four weeks. Concomitant therapy; both groups received 3 hours daily of conventional rehabilitation programme which included ADL training, stretching, range of motion and strengthening exercises, endurance training, gait training, orthosis, and education, as appropriate.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Not stated/unclear
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as	Not stated/unclear

measured by NIHSS scale)	
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Not stated/unclear
Comparator	The control group received 3 hours daily of conventional rehabilitation programme which included ADL training, stretching, range of motion and strengthening exercises, endurance training, gait training, orthosis, and education, as appropriate.
Number of participants	65
Duration of follow-up	3 months
Indirectness	NR

Elements of the study relating to qualitative themes	CIMT individual therapy hospital based
Additional comments	NR

Study arms

physiotherapy > 4 hours, 5 days per week (N = 32)
This was done for three hours in a day alternatively for three days a week. A constraint session of the unaffected limb was also used for five hours per day for five days a week. For the constraint session the patient's unaffected hand and wrist was covered with a mitt during times of frequent arm use and during activities of mCIMT. The total duration of intervention was four weeks

physiotherapy >2-4 hours 5 days per week (N = 33)
The control group received 3 hours daily of conventional rehabilitation programme

Characteristics

Study-level characteristics

Characteristic	Study (N = 60)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy > 4 hours, 5 days per week (N = 32)	physiotherapy >2-4 hours 5 days per week (N = 33)
% Female Nominal	33	20
Mean age (SD) Mean (SD)	47.03 (13.76)	46.3 (13.6)
Time period since stroke Mean (SD)	10.07 (6.21)	10.18 (6.17)

Outcomes

Study timepoints

- Baseline
- 3 month

3 months outcomes

Outcome	physiotherapy > 4 hours, 5 days per week, Baseline, N = 30	physiotherapy > 4 hours, 5 days per week, 3 month, N = 30	physiotherapy >2-4 hours 5 days per week, Baseline, N = 30	physiotherapy >2-4 hours 5 days per week, 3 month, N = 30
physical function - upper limb - fugel meyer assessment 0-66 Mean (SD)	34.67 (3.55)	50.57 (4.97)	34.7 (3.19)	46.93 (3.41)
Discontinuation no reasons provided Nominal	0	2	0	3

physical function - upper limb - fugel meyer assessment - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better
final values

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

3monthsoutcomes-fugelmeyerassessment-MeanSD-Modified Constraint Induced Movement Therapy (mCIMT)-conventional rehabilitation-t3

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Indirectly applicable *(looks at CIMT in addition to usual care. not specifically assessing intensity)*

3monthsoutcomes-Discontinuation-Nominal-Modified Constraint Induced Movement Therapy (mCIMT)-conventional rehabilitation-t3

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

Yoo, 2013

Bibliographic Reference	Yoo, Dh; Cha, Yj; Kim, Sk; Lee, Js; Effect of three-dimensional robot-assisted therapy on upper limb function of patients with stroke; Journal of Physical Therapy Science; 2013; vol. 25 (no. 4); 407-9.

Study details

Secondary publication of	NR

another included study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study type	Randomised controlled trial (RCT)
Study location	South Korea
Study setting	No information
Study dates	NR
Sources of funding	NR
Inclusion criteria	Twenty-two participants with no visual neglect or impaired cognitive function (Mini Mental Status Examination score > 24 points) were recruited.
Exclusion criteria	NR
Recruitment / selection of participants	Twenty-two participants with no visual neglect or impaired cognitive function (Mini Mental Status Examination score > 24 points) were recruited. All subjects gave their written informed consent to participation in the experiment in accordance with the ethical standards of the Declaration of Helsinki
Intervention(s)	The experimental group received three-dimensional robot assisted therapy (RAT) and conventional rehabilitation therapy (CRT) for a total of 90 minutes (RAT: 30 min, CRT: 60 min) a day with 10 minutes rest halfway through the session. The

	experimental group received training 3 days a week for 6 weeks. ReogoTM(Motorika, USA) human arm is able to move in various directions in three-dimensional space. This automated device permits not only active movement but passive movement with continuous feedback. Voice guidance can be used to encourage more intensive training. Three-dimensional forward reach training was used for the experimental group in our study. One session consisted of 12 types of reaching patterns, and 10 training sessions were performed in 30 minutes. Patients who complained about fatigue during RAT were allowed to stop and rest. RAT was then resumed. All training was carried out after a therapist had examined subjects' range of motion. The clinician judged individuals' current functional state of subjects, and selected the most suitable exercise mode. Concomitant therapy: all patients received conventional rehabilitation for 60 mins per day, 3 days a week for 6 weeks.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	physiotherapists
Subgroup 1: Community-based vs. hospital-based	Not stated/unclear
Subgroup 2: Time after stroke at the start of the trial	Chronic (>6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear

Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The control group received conventional rehabilitation for 60 mins per day. They received training 3 days a week for 6 weeks.
Number of participants	22
Duration of follow-up	6 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	Robot assisted therapy

	intensity tailored to the individual feedback - 'The automated device permits not only active movement but passive movement with continuous feedback. Voice guidance can be used to encourage more intensive training.' fatigue - 'Patients who complained about fatigue during RAT were allowed to stop and rest.'
Additional comments	NR

Study arms

physiotherapy </=45 mins, 5 days per week + conventional rehabilitation (N = 11)
The experimental group received three-dimensional robot assisted therapy (RAT) and conventional rehabilitation therapy (CRT) for a total of 90 minutes (RAT: 30 min, CRT: 60 min) a day with 10 minutes rest halfway through the session. The experimental group received training 3 days a week for 6 weeks. total dose for 5 days per week is >45 mins to 1 hour

physiotherapy </= 45 mins per day, 5 days per week (N = 11)
The control group received conventional rehabilitation for 60 mins per day. They received training 3 days a week for 6 weeks.

Characteristics

Study-level characteristics

Characteristic	Study (N = 22)
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation (N = 11)	physiotherapy </= 45 mins per day, 5 days per week (N = 11)
% Female Nominal	36	45
Mean age (SD) Mean (SD)	50.9 (10.9)	49.7 (8.9)

Characteristic	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation (N = 11)	physiotherapy </= 45 mins per day, 5 days per week (N = 11)
Time period since stroke (Months) Mean (SD)	45.8 (41.8)	41.5 (33.1)

Outcomes

Study timepoints

- Baseline
- 6 week

6 week outcomes

Outcome	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation , Baseline, N = 11	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation , 6 week, N = 11	physiotherapy </= 45 mins per day, 5 days per week, Baseline, N = 11	physiotherapy </= 45 mins per day, 5 days per week, 6 week, N = 11
Physical function upper limb - wolf motor function 0-120 Mean (SD)	41.7 (15.5)	43.4 (15.9)	33 (6.1)	33.3 (6.3)
ADLs (Modified Barthel Index) 0-100	77.5 (9.6)	77.9 (9.7)	75.3 (5)	75.4 (5.1)

Outcome	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation , Baseline, N = 11	physiotherapy </=45 mins, 5 days per week + conventional rehabilitation , 6 week, N = 11	physiotherapy </= 45 mins per day, 5 days per week, Baseline, N = 11	physiotherapy </= 45 mins per day, 5 days per week, 6 week, N = 11
Mean (SD)				
Discontinuation No of events	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0	n = 0 ; % = 0

Physical function upper limb - wolf motor function - Polarity - Higher values are better
ADLs (Modified Barthel Index) - Polarity - Higher values are better
Discontinuation - Polarity - Lower values are better

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

6weekoutcomes-ADLs(ModifiedBarthelIndex)-MeanSD-physiotherapy </=45 mins, 5 days per week + conventional rehabilitation - physiotherapy </= 45 mins per day, 5 days per week-t6

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

6weekoutcomes-Physicalfunctionupperlimb-wolfmotorfunction-MeanSD-physiotherapy </=45 mins, 5 days per week + conventional rehabilitation -physiotherapy </= 45 mins per day, 5 days per week-t6

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

6weekoutcomes-Discontinuation-NoOfEvents-physiotherapy </=45 mins, 5 days per week + conventional rehabilitation -physiotherapy </= 45 mins per day, 5 days per week-t6

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

Yoo, 2010

Bibliographic Reference	Yoo, S. D.; Jeong, Y. S.; Kim, D. H.; Lee, M. A.; Noh, S. G.; Shin, Y. W.; The Efficacy of Core Strengthening on the Trunk Balance in Patients with Subacute Stroke; Journal of korean academy of rehabilitation medicine; 2010; vol. 34 (no. 6); 677-682

Study details

Secondary publication of	NR

another included study- see primary study for details	
Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Korea
Study setting	In patient rehabilitation
Study dates	Jan 2008 until May 2009
Sources of funding	supported from a grant from Kyung Hee University
Inclusion criteria	Acute and Sub-acute stroke patients who had been in rehabilitation.
Exclusion criteria	patients who could not communicate with the therapist (severe aphasia or cognitive impairment), patients who were paralysed on both sides, patients suffering from other neurologic diseases, patients' with neurologic deficit, neglect, and patients with severe internal diseases and severe back pain of other musculoskeletal disorder.
Recruitment / selection of participants	Acute and Sub-acute stroke patients who had been in rehabilitation from Jan 2008 to may 2009
Intervention(s)	Both groups underwent physiotherapy for 4 weeks. In the experimental group, patients participated in an extra core strengthening programme 3 x per week. the core training adopted various exercises. patients started with the easy exercises and progressed to the more challenging exercise. patients who did not have enough muscle strength were

	assisted by the therapists during exercise and both the affected and non affected sides were exercises. core stability strengthening was performed for 30 mins 3 x per week for 4 weeks. Concomitant therapy: all patients tried a neuro-developmental technique, walking and occupational therapy 3 x per week.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Functional independency
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months

Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	in the control group patients tried a neuro-developmental technique, walking and occupational therapy 3 x per week.
Number of participants	59
Duration of follow-up	4 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	supervision Hospital based therapy individual therapy
Additional comments	NR

Study arms

physiotherapy </= 45 mins, 3 days per week (N = 28)
core strengthening programme provided 30 mins per day, 3 days per week in addition to usual care.

physiotherapy 3 days per week - no intensity provided (N = 31)
Participants were given a neuro-developmental technique, walking, and occupational therapy 3 x per week.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 59)**
Comorbidities Nominal	NR
Severity Nominal	NR

Arm-level characteristics

Characteristic	**physiotherapy </= 45 mins, 3 days per week (N = 28)**	**physiotherapy 3 days per week - no intensity provided (N = 31)**
% Female Nominal	54	45

Characteristic	physiotherapy </= 45 mins, 3 days per week (N = 28)	physiotherapy 3 days per week - no intensity provided (N = 31)
Mean age (SD) Mean (SD)	59.61 (18.16)	61.77 (12.58)
Time period since stroke Mean (SD)	42.86 (35.08)	48.03 (29.45)

Outcomes

Study timepoints

- Baseline
- 4 week

physiotherapy </= 45 mins 3 x per week vs usual care

Outcome	physiotherapy </= 45 mins, 3 days per week , Baseline, N = 28	physiotherapy </= 45 mins, 3 days per week , 4 week, N = 28	physiotherapy 3 days per week - no intensity provided, Baseline, N = 31	physiotherapy 3 days per week - no intensity provided, 4 week, N = 31
physical function lower limb - berg balance scale 0-56 Mean (SD)	20.21 (16.15)	31.5 (17.82)	20.55 (15.2)	26.87 (15.74)

physical function lower limb - berg balance scale - Polarity - Higher values are better

final values

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

physiotherapy</=45mins3xperweekvsusualcare-physicalfunctionlowerlimb-bergbalancescale-MeanSD-physiotherapy </= 45 mins, 3 days per week -physiotherapy 3 days per week - no intensity provided-t4

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(no information on missing data)*
Overall bias and Directness	Overall Directness	Directly applicable

Yoon, 2014

Bibliographic Reference	Yoon, J. A.; Koo, B. I.; Shin, M. J.; Shin, Y. B.; Ko, H. Y.; Shin, Y. I.; Effect of constraint-induced movement therapy and mirror therapy for patients with subacute stroke; Ann rehabil med; 2014; vol. 38 (no. 4); 458-66

Study details

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

Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study type	Randomised controlled trial (RCT)
Study location	Korea
Study setting	in patients at the Department of Rehabilitation Medicine at Pusan National University Yangsan Hospital
Study dates	October 2012 to May 2013
Sources of funding	This work was supported by a 2-year research grant of Pusan National University
Inclusion criteria	The inclusion criteria for the current study are as follows: 1) patients who were diagnosed with hemiplegia due to stroke (onset time of less than six weeks) and have no past history of stroke; 2) patients who could perform an active extension of the affected wrist and more than two fingers at an angle of >10° and an active abduction of the affected thumb at an angle of >10°; 3) patients who can make a simple communication; 4) patients who can receive care by guardians or caregivers; and 5) patients who can maintain a sitting position for more than 30 minutes.
Exclusion criteria	The following patients were excluded: the patients with depression who were unable to cooperate in the treatment; the patients who cannot perform the active task training due to the presence of musculoskeletal problems, such as the spasticity of Modified Ashworth Scale (MAS) II or higher; and the patients who have complex regional pain syndrome or secondary adhesive capsulitis.
Recruitment / selection of participants	The patients in this study were hospitalized for further evaluation and treatment of stroke at the Department of Rehabilitation Medicine at Pusan National University Yangsan Hospital, from October 2012 to May 2013. They have developed subacute stroke when they were enrolled in the present study.

Intervention(s)	In CIMT combined with mirror therapy group and CIMT only group, patients wore a specially designed orthosis to suppress the motion of the unaffected upper extremity for a total of two weeks. The patients received intensive training for five days a week except for the weekend, for a total of six hours (2 hours in the therapy room and 4 hours in the inpatient room) a day except for sleeping hours. During the time, intensive fine motor exercise of the hemiplegic upper extremity was performed under the supervision of occupational therapist. The mirror therapy was performed for 30 minutes a day for five days a week, for two weeks. During the mirror therapy, the patients performed flexion/extension of the shoulder, elbow, wrist, finger, and pronation/supination of the forearm according to the verbal commands. They were also recommended to perform the objective task training with the unaffected hands. The patients of the CIMT combined with mirror therapy group did not receive the palliative rehabilitation therapy, and the mirror therapy was performed during hours when the CIMT was not done. The patients of the CIMT only group were recommended to perform CIMT, palliative rehabilitation therapy, and additional self-exercise program to minimize the difference in the total amount of treatment time between the three groups. Moreover, the involvement of full-time nurses and guardians were maximised to improve the treatment compliance and to lower the drop-out rate. Furthermore, it was easier to monitor the length of time the patients wear the orthosis, by enrolling hospitalised patients in this study rather than the outpatients. Concomitant therapy; both groups received conventional therapy for 40 minutes per day, 5 days per week for 2 weeks. no additional details on this were provided.
Intervention stratification - Type of therapist	Physiotherapy
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Hospital-based rehabilitation

Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable
Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Non-computer based approach only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	The patients of the control group were recommended to perform the self-exercise program as well as the palliative rehabilitation therapy that is routinely recommended for the hospitalized patients. The patients of the CIMT combined with mirror therapy group did not receive the palliative rehabilitation therapy, and the mirror therapy was performed during hours when the CIMT was not done. The patients of the CIMT only group were recommended to perform CIMT, palliative rehabilitation therapy, and additional self-exercise program to minimize the difference in the total amount of treatment time between the three groups.

Number of participants	26
Duration of follow-up	2 weeks
Indirectness	NR
Elements of the study relating to qualitative themes	CIMT intensity tailored to the individual - smaller blocks of treatment Self management programme - as part of both interventions supervision - study reported using nurses and therapists to supervise to increase adherence inpatient setting individual therapy
Additional comments	NR

Study arms

physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care (N = 17)
CIMT combined with mirror therapy and CIMT for 2 hours 3 days per week + self exercise programme for 30 mins 5 days per week + conventional rehabilitation 40 mins for 5 days per week. total therapy time = >2-4 hours 5 days per week

physiotherapy > 1-2 hours, 5 days per week (N = 9)
conventional rehabilitation for 40 mins per day, 5 days per week. plus self management programme for 30 mins per day, 5 days per week. plus palliative rehabilitation programme for 30 mins, 5 days per week

Characteristics

Study-level characteristics

Characteristic	**Study (N = 26)**
Ethnicity Nominal	NR
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care (N = 17)	physiotherapy > 1-2 hours, 5 days per week (N = 9)
% Female Nominal	29	55
Mean age (SD) Mean (SD)	56.3 (14.3)	60.56 (16.94)
Time period since stroke Mean (SD)	21.6 (10.6)	24.78 (11.61)

Outcomes

Study timepoints

- Baseline
- 2 week

2 week outcomes

Outcome	physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care, Baseline, N = 17	physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care, 2 week, N = 17	physiotherapy > 1-2 hours, 5 days per week, Baseline, N = 9	physiotherapy > 1-2 hours, 5 days per week, 2 week, N = 9
physical function upper limb - FMA UL 0-66 Mean (SD)	42 (22.01)	50.35 (19.99)	32.67 (21.7)	37 (21.06)
ADLs - Korean modified barthel index 0-100 Mean (SD)	57.49 (14.85)	62.94 (14.21)	52.11 (25.06)	57.44 (26.35)

physical function upper limb - FMA UL - Polarity - Higher values are better
ADLs - Korean modified barthel index - Polarity - Higher values are better
final values

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

2weekoutcomes-physicalfunctionupperlimb-FMAUL-MeanSD-physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care-physiotherapy > 1-2 hours, 5 days per week-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to no information on missing data)*

Section	Question	Answer
Overall bias and Directness	Overall Directness	Directly applicable *(combined 2 treatment arms as they used the same dose of treatment)*

2weekoutcomes-Koreanmodifiedbarthelindex-MeanSD-physiotherapy > 1-2 hours, 5 days per week + 40 mins usual care-physiotherapy > 1-2 hours, 5 days per week-t2

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Some concerns *(due to no information on missing data)*
Overall bias and Directness	Overall Directness	Directly applicable *(combined 2 treatment arms as they used the same dose of treatment)*

Zengin-Metli, 2018

Bibliographic Reference	Zengin-Metli, D.; Ozbudak-Demir, S.; Eraktas, I.; Binay-Safer, V.; Ekiz, T.; Effects of robot assistive upper extremity rehabilitation on motor and cognitive recovery, the quality of life, and activities of daily living in stroke patients; Journal of Back & Musculoskeletal Rehabilitation; 2018; vol. 31 (no. 6); 1059-1064

Study details

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

Other publications associated with this study included in review	NR
Trial name / registration number	NR
Study location	Turkey
Study setting	rehabilitation centre
Study dates	Nr
Sources of funding	NR
Inclusion criteria	Inclusion criteria were: stroke patients according to the World Health Organisation, ages between 45-75 years, time after stroke of 6-24 weeks, upper extremity Brunnstrom stage 3-6, Cooperative.
Exclusion criteria	Exclusion were: Unstable patients with systemic problems such as heart failure and lung disease, limited range of motion in the upper limbs, ataxia, dystonia and dyskinesia, visual and or hearing impairments, aphasia, severe spasticity, received Botulinum toxin A injection within last 6 months, shoulder subluxation in the upper limbs.
Recruitment / selection of participants	Subjects who had subacute hemiplegia due to cerebrovascular accident were included consecutively.
Intervention(s)	Armeo Spring HocomAg inc. was used for the robotic rehabilitation. The programme (game, duration, level of difficulty) was individualised according to the patients ability and motor stage. level of difficulty was changed throughout the rehabilitation process and either increased for successful subjects or made easier for unsuccessful subjects by the same therapist.

	computer games encouraged shoulder, wrist, forearm and hand movements by joystick gripping and releasing. The robotic rehabilitation was provided 5 x per week for 3 weeks of 30 mins per session. Concomitant therapy: All subjects received conventional rehabilitation 5 x per week for 3 weeks. Conventional rehabilitation consisted of neurophysiological exercises with Brunnstrom approach, range of motion exercises and postural education.
Population subgroups	physiotherapist
Subgroup 1: Community-based vs. hospital-based	Not stated/unclear
Subgroup 2: Time after stroke at the start of the trial	Subacute (7 days - 6 months)
Subgroup 3: Severity (as stated by category or as measured by NIHSS scale)	Not stated/unclear
Subgroup 4: Focus of care	Upper limb
Subgroup 5: Type of communication difficulty	not applicable

Subgroup 6: Duration of therapy	Less than and equal to 6 months
Subgroup 7: Computer-based tools	Computer-based tools only
Subgroup 8: Professional providing care	Physiotherapists
Comparator	All subjects received conventional rehabilitation 5 x per week for 3 weeks. conventional rehabilitation consisted of neurophysiological exercises with Brunnstrom approach, range of motion exercises and postural education.
Number of participants	35
Duration of follow-up	NR (assuming it is post intervention of 3 weeks)
Indirectness	NR
Elements of the study relating to qualitative themes	robot assisted therapy programme tailored to the individual most patients reported they were motivated in the rehabilitation programme and authors believed the robotic therapy increased motivation. variety

	Individual therapy Hospital based therapy
Additional comments	NR

Study arms

physiotherapy </= 45 mins, 5 days per week + usual care (N = 20)
All subjects received a conventional rehabilitation program five times a week for 3 weeks. In addition, robotic group received robotic rehabilitation five times a week for 3 weeks (30 minutes per session).

physiotherapy </= 45 mins 5 days per week (N = 15)
A conventional rehabilitation program five times a week for 3 weeks.

Characteristics

Study-level characteristics

Characteristic	**Study (N = 35)**
Ethnicity Nominal	NR

Characteristic	Study (N = 35)
Comorbidities Nominal	NR
Severity Nominal	NR
Type of communication difficulty Nominal	NR

Arm-level characteristics

Characteristic	physiotherapy </= 45 mins, 5 days per week + usual care (N = 20)	physiotherapy </= 45 mins 5 days per week (N = 15)
% Female Nominal	25	60
Mean age (SD) Mean (SD)	59.25 (8.1)	63.27 (3.88)
Time period since stroke Mean (SD)	10.7 (4.9)	11.33 (5.26)

Outcomes

Study timepoints

- Baseline
- 3 week (No time point stated in study. assuming it is immediately post intervention)

physiotherapy </=45 mins, 5 days per week + usual rehab vs physiotherapy (usual rehab) </= 45 mins, 5 days per week

Outcome	physiotherapy </= 45 mins, 5 days per week + usual care, Baseline, N = 20	physiotherapy </= 45 mins, 5 days per week + usual care, 3 week, N = 20	physiotherapy </= 45 mins 5 days per week, Baseline, N = 15	physiotherapy </= 45 mins 5 days per week, 3 week, N = 15
Physical function - upper limb - fugel meyer assessment - shoulder/elbow/forearm 0-66 Mean (SD)	20.3 (6.02)	24.65 (4.56)	24.07 (4.73)	24.65 (4.56)
Person/participant generic health-related quality of life - SF36 physical component 0-100 Mean (SD)	30.21 (7.38)	34.57 (10.07)	33.19 (8.52)	34.56 (10.38)
Person/participant generic health-related quality of life - SF-36 mental component 0-100 Mean (SD)	50.05 (10.72)	52.55 (9.4)	38.95 (15.2)	42.17 (17.1)

Physical function - upper limb - fugel meyer assessment - shoulder/elbow/forearm - Polarity - Higher values are better
Person/participant generic health-related quality of life - SF36 physical component - Polarity - Higher values are better

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

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

physiotherapy</=45mins,5daysperweek+usualrehabvsphysiotherapy(usualrehab)</=45mins,5daysperweek-SF-36mentalcomponent-MeanSD-physiotherapy </= 45 mins, 5 days per week + usual care-physiotherapy </= 45 mins 5 days per week-t3

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

physiotherapy</=45mins,5daysperweek+usualrehabvsphysiotherapy(usualrehab)</=45mins,5daysperweek-SF36physicalcomponent-MeanSD-physiotherapy </= 45 mins, 5 days per week + usual care-physiotherapy </= 45 mins 5 days per week-t3

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

physiotherapy</=45mins,5daysperweek+usualrehabvsphysiotherapy(usualrehab)</=45mins,5daysperweek-Physicalfunction-upperlimb-fugelmeyerassessment-shoulder/elbow/forearm-MeanSD-physiotherapy </= 45 mins, 5 days per week + usual care-physiotherapy </= 45 mins 5 days per week-t3

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

Appendix E – Qualitative evidence

Bennett, 2016

Bibliographic Reference	Bennett, L.; Luker, J.; English, C.; Hillier, S.; Stroke survivors' perspectives on two novel models of inpatient rehabilitation: seven-day a week individual therapy or five-day a week circuit class therapy; Disability & Rehabilitation; 2016; vol. 38 (no. 14); 1397-406

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	Hillier S, English C, Crotty M, et al. Circuit class or seven day therapy for increasing intensity of rehabilitation after stroke. Protocol of the CIRCIT trial. Int J Stroke. 2011;6:560-565 English C, Bernhardt J, Hillier S. Circuit Class Therapy and 7-Day-Week Therapy increase physiotherapy time, but not patient activity: early results from the CIRCIT trial. Stroke. 2014;45:3002-3007.
Aim	To explore the experiences, perceptions and preferences of stroke survivors with respect to two novel models of increasing physiotherapy - seven days a week individual therapy or five days a week circuit therapy.
Population	Stroke survivors N=10 Participants from a larger randomised controlled trial (CIRCIT) who received either seven days per week physiotherapy provided in individual therapy sessions with a one therapist to one patient ratio, or group circuit class therapy five days a week. Current residents of South Australia, with sufficient cognitive and language ability to participate in an interview and were able to provide informed consent to this sub-study. Maximum variation in age and gender was sought in both models

	of rehabilitation received, in order to explore the common and unique perspectives of a demographically heterogenous group of participants. Characteristics: Mean age (range): 71 (46-89) years. Male:Female = 7:3. Stroke type: Haemorrhage = 3, Partial anterior circulation infarct = 4, Lacunar infarct = 2, Total anterior circulation infarct = 1. Days since stroke (range): 205 (151-312) days. Days since discharge (range): 124 (26-225) days. Mode of therapy received: 7 days = 3. circuit = 7. Hospital site: Site 1 = 7, Site 2 = 3.
Setting	Current residents of South Australia. Conducted as a substudy of a larger randomised controlled trial (the CIRCIT trial). Competed during inpatient rehabilitation after stroke.
Study design	A qualitative descriptive study undertaken using semi-structured interviews and thematic analysis. Purposive sampling was employed. Selection was conducted by the CIRCIT project manager by reviewing data collection sheets on an individual's completion of the trial. Participants were recruited on an individual, ongoing basis until data saturation was achieved. Face to face, semi-structured interviews of approximately 30 minutes duration were conducted by the primary investigator within the participants' usual place of residence. The interview prepared for the interviews by meeting with all investigators regularly and conducting pilot interviews. A written prompt sheet of open-ended questions and broad topics guided the interview process. The interviewer was independent of the CIRCIT trial, and had not previous contact with the recruited participants. Interviews were digitally audio-recorded, transcribed verbatim and anonymised.
Methods and analysis	A qualitative descriptive approach with thematic analysis was conducted. Data collection and analyses occurred simultaneously, in an iterative process. Full interview transcripts were analysed by two researchers independently. Themes identified within the data were constantly compared within and between transcripts in a three-stage process of thematic analysis: open coding, axial coding (relationships) and selective coding. Data were initially coded inductively line by line, similarly codes were aligned with established codes and new codes were created as new concepts emerged. Relationships between codes were subsequently identified, and codes were grouped together into centralised themes and sub-themes. Independent findings from the two coding researchers were compared and any differences were discussed until consensus was reached.

	The researchers' role and associated potential biases were critically examined with reflexive analysis techniques throughout the research process. These techniques included keeping an audit trail of all discussion and decisions as well as the primary investigator keeping a journal, which chronicled personal impressions and observations throughout. These techniques aided rigour (trustworthiness) along with other features of the design, such as systematic data collection, purposive sampling for maximum variation, verbatim transcripts, reporting of quotes and triangulation of data using two independent coders and data from multiple sites.
Findings	Three main themes emerged from the data: **Theme 1: too much, too little or just right** *More is better* The belief that more therapy meant better outcomes was expressed by many participants, who associated increased quantity with greater functional improvement, psychological benefits and earlier and greater independence. Some participants believed they were capable of training at a greater intensity within physiotherapy sessions. Participants' ability to cope with the demands made of them by staff varied. One participant experienced difficulty tolerating the demands of one physiotherapist. Another was appreciative of the virtuous intentions behind staff demands. Similarly, views regarding resting within physiotherapy sessions varied. One participant appreciated being offered the option to rest when needed. Other participants preferred not to rest during therapy sessions because it made resuming exercises difficult. *How long and how often: physiotherapy session length and frequency* Even though most participants understood that more might be better, the 'idea' therapy duration and frequency varied between participants. Participants perceived there was an upper limit to their personal physical capacity with respect to endurance. Ninety-minute therapy sessions were challenging for some circuit participants and several described tiring

easily. Despite difficulty with circuit session length some indicated that it was acceptable given their goal of going home. Seven-day therapy sessions were comparatively shorter at 30 to 60 minutes, and some recipients indicated they could have tolerated more therapy time per day. More frequent sessions, rather than longer sessions were advocated by some, and other saw twice daily physio as a way of achieving more therapy time, and maintaining momentum. However, twice daily therapy sessions were too challenging for some circuit participants. Fatigue and/or lower limb soreness were reported by most circuit participants. One participant suggested that the second daily session of therapy be limited to a maximum of twice weekly.

Recipients of seven-day therapy appreciated the daily opportunity of progressing their recovery. Some circuit therapy participants would have preferred seven-day therapy to maintain therapy gains made during the week. Several reported difficulty restarting therapy after a weekend break. Keeping busy was important to some participants and seven-day therapy provided an antidote to boredom on weekends. Conversely, having a break to rest and recover on weekends was valued in both groups.

Hard work side effects

Fatigue related to physical exertion was experienced by most circuit participants. In contrast, fatigue was not emphasised by non-circuit participants. One denied experiencing any fatigue, and other reported it as being an occasional experience rather than an ongoing one. Physical discomfort and difficulty during therapy was reported by some participants, who struggled with the intensity of their programme.

Theme 2: my experience - along and together (psychosocial experiences)

Personal achievement

Many participants recounted feeling both challenged by their therapy and rewarded by the success of achieving milestones in mobility and independence.

Working together: Observing and interacting with others

Observation of other patients provided hope and enhanced self-motivation for several participants from both therapy formats. Mutual support and encouragement, gained through interaction with other stroke patients during circuit group therapy sessions was valued by many participants. Participants receiving seven-day therapy also reported support and encouragement between stroke patients, both within and outside the therapy room. Camaraderie with other stroke survivors was reported by many participants, who valued the opportunity to talk and joke with others in similar circumstances. Two circuit participants were less enthusiastic about group interaction during therapy, one felt socially excluded from the therapy group and another preferred to focus upon herself during therapy.

Denial

Post-stroke denial delayed initial engagement with therapy for one circuit participant: they believed they could have transcended this period of denial faster with individual (rather than group) therapy.

Concentration

Difficulty concentrating during physiotherapy sessions was experienced by some participants.

Theme 3: meeting MY needs

Customised content

Many participants from both therapy formats believed that the content of the physiotherapy programme was suitably customised to meeting their individual ability and needs.

Limitations and lack of choice, variety

Limitations and lack of choice within therapy sessions were reported by some participants and in some instances individual needs were not optimally met. Some circuit participants reported that the opportunity for longer individual overground walking with the support of a staff member was limited in a group format, as staff availability was restricted by the number and needs of others in the group. Individual therapy was seen by some as providing greater flexibility of choice in exercise type and amount by some participants. However, receiving individual therapy sessions did not always guarantee that all individual needs would be met. One participant strongly believed he would benefit from hydrotherapy and described frustration at not being able to access it as an inpatient, despite persistently requesting it. Infrequent upper limb therapy worried some.

Several participants from both formats described their therapy as repetitious, and repetition was perceived as necessary for improving their recovery of function. Most participants from both formats were content with the variety of exercises in their programme. Some participants valued the variety that accompanied staff rotations. This was especially evident in examples provided by participants receiving seven-day therapy, who enjoyed a change in routine and challenges with weekend staff.

Supervision, feedback and waiting

Participants receiving individual therapy sessions were appreciative of the individual attention they received. One participant described how he valued the continual close support he received. Circuit group therapy participants reported

	that circuit group sizes varied from three to 10 attendees, with a staff to patient ratio of no more than one staff member to three participants. Some participants found this format acceptable and believed the amount of individual attention they received was sufficient. Conversely, some participants would have appreciated more supervision than they received. The need for closer supervision was particularly evident when using equipment like the treadmill. Feedback from staff during therapy sessions was highly valued. One circuit participant believed the amount of feedback received from staff during physiotherapy sessions was comparatively less in a group format, than in one-to-one sessions. Some circuit participants disliked waiting for staff assistance between exercises. They would have liked greater continuity with quicker transition times between exercises and believed that this would be more likely if they received individual therapy.
Limitations and applicability of evidence	Limitations: The applicability of the results may be limited, as they represent a specific time and place. Data saturation in relation to the themes was reached in the final two interviews; however, it may be argued that different themes may emerge where therapy structure and content is different. They excluded people who were unable to participate in an interview due to limited English language, expressive language or cognitive reasons. People's responses could be subject to recall bias as they were interviewed several months after the intervention in question was finished. Applicability of evidence: Partially applicable. Completed in Australia, but regarding a practice that is conducted in the United Kingdom.

Study arms

Stroke survivors (N = 10)
Participants from a larger randomised controlled trial (CIRCIT) who received either seven days per week physiotherapy provided in individual therapy sessions with a one therapist to one patient ratio, or group circuit class therapy five days a week. Current residents of South Australia, with sufficient cognitive and language ability to participate in an interview and were able to provide informed consent to this sub-study. Maximum variation in age and gender was sought in both models of rehabilitation received, in order to explore the common and unique perspectives of a demographically heterogenous group of participants.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Bowen, 2012

Bibliographic Reference	Bowen, A.; Hesketh, A.; Patchick, E.; Young, A.; Davies, L.; Vail, A.; Long, A.; Watkins, C.; Wilkinson, M.; Pearl, G.; Lambon Ralph, M.; Tyrrell, P.; investigators, A. C. T. NoW; Clinical effectiveness, cost-effectiveness and service users' perceptions of early, well-resourced communication therapy following a stroke: a randomised controlled trial (the ACT NoW Study); Health Technology Assessment (Winchester, England); 2012; vol. 16 (no. 26); 1-160

Study details

Secondary publication of another included study- see primary study for details	No additional information
Other publications associated with this study included in review	The RCT was published within the same study document. The RCT does not fulfil the inclusion criteria for this review, but the qualitative element discusses intensity and so is considered for this review.
Aim	1. To explore participants'/carers' experiences of speech and language therapy intervention or visitor support.

	2. To evaluate from participants'/carers' perspectives the effectiveness of speech and language therapy intervention or visitor support, in terms of both process and outcome. 3. To compare the perceived impact on participant and carer well-being of speech and language therapy intervention or visitor support.
Population	People with stroke N=22 People with stroke and communication difficulties who had participated in a quantitative trial (ACT NoW - Assessing the effectiveness of Communication Therapy in the North West). The inclusion criteria for that study were: Adults with a stroke who were admitted to hospital; communication impaired due to aphasia or dysarthria; considered, by the speech and language therapist, able to engage in therapy and likely to benefit from communication therapy; informed consent or proxy consent provided by carers. Exclusion criteria: subarachnoid haemorrhage; dementia; pre-existing learning disabilities likely to prevent benefits from therapy; unable to communicate in the English language (provision of bilingual speech and language therapists were considered to be beyond the scope of the study); other serious concomitant medical conditions (such as newly diagnosed terminal disease); the person being unable to complete eligibility screening, even after three attempts over a 2-week period; family or carer objections; (rare) cases when a speech and language therapist was asked to contribute to an urgent assessment of a person's mental capacity to consent to an NHS treatment, before the therapist had time to complete screening to determine eligibility for the trial. Characteristics: Men:women = 13:9. Median age (range): 73 (53-98) years. Dysarthria: 5. Aphasia: 12. Dysarthria and aphasia: 5. Carers N=10 Carers (defined as a relative or friend identified by the participant as fulfilling a caring role). All by one were live-in carers, with 8 out of 10 being the participant's spouse. Seven were in full time employment.

	Men:women = 8:2. Median age (range): 56 (38-77) years.
Setting	Participants were recruited from the ACT NoW RCT. In the context of usual NHS stroke care from 12 NHS sites across England. Recruitment took place during the inpatient phase. Interventions were delivered across the stroke pathway (hospital and community).
Study design	An interview approach adapted to people with communication difficulties. The interviewer was provided with training in how to communicate effectively with people with aphasia/dysarthria from speech and language therapists. The use of supported communication techniques and attention to meta-communication strategies were emphasised. The research user group also supplied training through means of role play and feedback on mock interviews in which they both participated and critical observed. An interview approach was developed to be highly structured yet highly flexible. It was based around a pictorial interview schedule, which was structured in three parts: 1) what happened in the sessions, 2) what participants felt was good/difficult about the sessions; 3) evaluation of overall impact. Part 1 consisted of pictorial representations of nine potential activities engaged in with the speech and language therapist or visitor. These could be ignored by those participants able to extemporise on the content of sessions, used as a structured means of reference to different potential answers that could then be elaborated on, used as an aide-memoire should participants experience memory difficulties as their answer progressed, or used as a means of pointing to assist non-verbal communication. Any and all uses were encouraged. In part 2 people were asked 'what were the good things?', 'what was difficult?' and 'what did you want more of?'. For those for whom sustaining conversation about these issues in the abstract was a challenge, prompt cards were available, which could either stand in for an answer or be used as a communication ramp to support an answer if full expression was proving difficult. For the most challenged, a picture was available as a consistent referent for a gesture or other means of non-verbal communication. In part 3, a visual analogue scale was made available to indicate evaluation of overall impact, which could be elaborated upon by those able to communicate in that way but would stand as a common denominator for all regardless of any extended communication. All interviews were both audio- and video-recorded to capture the holistic nature of a participant's communication strategies.

	Carers were viewed as an important but distinct part of the rehabilitation process and as people who experience different yet related challenges from those with aphasia and dysarthria. The semistructured carer interview was designed to explore how carers perceived the speech and language therapist/visitor, and the support he or she provided; view on the friend's/relative's communication improvements since participation; and the impact on the carer's life of participation in either the speech and language therapy intervention or visitor support. these interviews were audio-recorded and transcribed verbatim for purposes of analysis.
Methods and analysis	The data generated varied in terms of style of expression, elaboration, intelligibility and medium. With conventionally generated spoken language data the first stage of the analysis process if usually a written transcription with a range of additional markers to preserve features of the expression that would not be immediately perceived from the text (such as irony). The vast majority of the interview data was amenable to this data processing. In addition, gestural communication that clearly supported spoken meaning was marked to the transcribed text. However, in around 10% of interviews there was so little spoken language expression and/or non-verbal communication that the context and intent was not understood with a high degree of certainty. Therefore, a conventional form of transcription was not possible. In between these two extremes, in about 10% of interviews some content was ambiguous to the researcher. Therefore, a data transformation protocol was developed guided by three principles: 1) a respect for the participants' efforts to ensure their opinions were recorded, by whatever media of communication they could use; 2) a concern not to over-interpret data whose the meaning was not clear; 3) to develop a process that had the potential to address the three levels of meaning sought in the data collection (what happened, participants' perceptions on what occurred and participants' views of the impact). The data transformation re-presented the data in a prose form amenable to conventional data processing. The protocol involved: 1) watching tapes and conventional verbatim transcription was applied, 2) re-watching the tapes and where there were gaps to add notes using NVivo 2.0 tool 'data-bites', 3) where the researcher was less confident about the interpretations, watched the relevant sections of the video and independently interpret the meaning. If there was disagreement, the speech and language therapist and researcher discussed their interpretation until a collaborative meaning was reached. If this was not achievable then the data section was not used, 4) a new document was created in NVivo 2.0 consisting of a prose summary made up of the prior. This was then inserted into the original interview section. A thematic analysis approach was taken with this information.

Findings	**Emotional well-being** The impact of those experiences on their emotional well-being. The impact on mood of encounters with visitor speech and language therapist became a central concern of the perceived effectiveness of that contact. Participants drew attention to the importance of knowing that a friendly and supportive person was there for them, particularly when they were feeling 'low'. Carers also experienced the mood-lifting effects of regular contact with someone. In generating these positive effects, the professional identity or role remit of the individual was of far less importance than their personal qualities including: ability to put the participant at ease; ability to make the participant feel individually of importance; the visitor/speech and language therapy displaying a positive mood themselves; being empathic; a good communicator. In addition, having contact could distract them from the day-to-day emotional difficulties of living with the consequences of stroke by giving them something new and enjoyable to focus on. Another aspect was learning to cope with how one was feeling and finding strategies of deal with changes in mood. Visits were also helpful in this respect. **Confidence** Participants identified the importance of their experiences for their confidence. Carers too recognised the central importance of confidence and how the contact aided in this. Although people in both study arms discussed the positive effects of the contact for confidence, there were differences in how the processes associated with confidence enhancement. Those with experience of the visitor tended to talk about how the normalising effects of regular contact with a stranger boosted their confidence. There was, however, an important caveat. Such perceived benefits were only possible because of how skilled interpersonally participants felt the visitors were. The participants who had the speech and language therapy tended to view improvements in confidence as a direct consequence of specific tasks and explicit agreed courses of action, rather than indirect benefits resulting from the encounter.

Observing progress

The importance of them being able to observe progress. The extent of improvement was to an extent less important than a sense of moving forward, rather than feeling stuck. For many there was an acknowledgement of spontaneous recovery or improvement. Consequently, the extent to which the visitor or speech and language therapist contact was seen to be a contributory factor also was varied. Nonetheless, the sense of being able to observe progress was of over-riding importance. How this was perceived to be achieved was different depending on whether the participant had the experience of the visitor or the speech and language therapist. Those with speech and language therapy experience described how therapists might deliberately point out their areas of weakness or skills they needed to develop in a targeted way. From that they learned new strategies for overcoming these difficulties. The extent of the deliberate strategy of the speech and language therapists was only appreciated with hindsight. For carers too, being able to tangibly recognised progress and making comparisons was vitally important. For those with the visitor, the emphasis was more on self-perceived differences and reflection, rather than specific tests of functional improvements. Simply communicating socially in a sustained way was seen to be a good basis for judgements of improvement. Communication was useful as family/friends might assume understanding of communication through familiarity, leaving little incentive to make communication improvements. For some participants who lived alone or had very limited contact with family and friends, something as basic as an assured, regular social encounter was a prerequisite for testing out whether or not they were getting better. Without it they may not talk regularly with anyone.

Guidance and support

Participants gave very different descriptions of the activities done with the therapists and visitors and how they perceived the nature of guidance and support. The training of visitors emphasised that they should not engage in strategies of deliberate therapeutic activities, which the participants noted. Speech and language therapy support was highly valued for the perceived professional expertise it brought to an individual's situation. People expressed this in terms of being given 'knowledge' and strategies to overcome specific difficulties that had been jointly identified. There was a strong perception of purposefulness in how participants described therapist support in focusing on difficulties and 'gaps' to communication. Visitors tended to not approach specific difficulties in such a structured way, with the visitor having a different kind of knowledge than that of directly knowing where specific difficulties lie. The visitor enabled participants to give to the visitor in terms of social interaction, offering their own knowledge in connection to a topic, suggesting greater perceived reciprocity.

Meeting individual needs

Underpinning participants' various descriptions of what the interventions had done and their value. Recognition of not just complexity and range of severity with communication difficulty manifest, but also the individual's psychosocial context. On the rare occasion when a participant expressed dissatisfaction with the contact they received, failure to recognise individual need was one component of the problem.

Amount and intensity

A distinguishing feeling was the intensive, as well as early, nature of speech and language therapy. People were aware that they were receiving a very different experience of contact than might be the case if they were not in the trial. Discussion about the amount and the intensity of the contact were therefore of considerable interest. Participants valued a high amount of contact, whether that be with the speech and language therapists or visitors. High amount of contact was defined by frequency, number and length of visits and/or amount of time spent with them. Furthermore, the amount of support was perceived to be closely connected with the benefit. More contact felt like more benefit in quite a straightforward equation for the majority of participants. Amount of contact was not the only issue. Some people also discussed the important of the quantity of contact being tempered with a sensitivity to meeting the particular needs that participants were experiencing at any given time. Part of this sensitivity was about flexibility and awareness of how easy it might be to feel overloaded, which could undermine the benefits of a large amount of contact. This was true both among those who had speech and language therapist contact and among those who had visitor contact.

Another aspect of amount and intensity concerned what happened between contacts with their speech and language therapist or visitor. Many of those with speech and language therapy experience were, as part of their therapy, given 'homework' between sessions with perhaps inevitable differences of opinion about whether or not this was helpful. For some it contributed to a feeling of overload. For others it was a vital component of that sense of a tempered approach to their needs. Those who had experience of the visitor were not left 'homework' in any structured or deliberate way.

	Nonetheless a few talked about creating their own homework and so self-regulating the intensity of the consequences of their contact. **Closure** Participants were asked about their experiences at the end of therapy/contact with the visitor. A small number in both arms saw the end of the intervention as premature, seeing 4 months as too brief a contact. The impact of termination for many was experienced emotionally, entailing a sense of loss or bereavement. For a minority the end of the contact was a relief due to the intensity or the work involved was perceived as too difficult to sustain. For a few, it was seen as a positive marker of progress.
Limitations and applicability of evidence	Limitations: Small number of participants. It was not possible to engage in theoretical sampling because of the small pool of potential participants at the time of data collection. Participants were not re-engaged in a process of validation of key interpretations and findings; however, main findings were shared with the research use group for comment and question. Applicability of the evidence: Directly applicable. United Kingdom based study. The intervention was provided at various intensities dependent on what the individual experienced, so findings about the intervention are not applicable to the review, but the discussion on intensity and how closure related to intensity is important and applicable.

Study arms

People with stroke (N = 22)
People with stroke and communication difficulties who had participated in a quantitative trial (ACT NoW).

Carers (N = 10)
Carers (defined as a relative or friend identified by the participant as fulfilling a caring role). All by one were live-in carers, with 8 out of 10 being the participant's spouse. Seven were in full time employment.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Burke, 2021

Bibliographic Reference	Burke, J.; Palmer, R.; Harrison, M.; What are the factors that may influence the implementation of self-managed computer therapy for people with long term aphasia following stroke? A qualitative study of speech and language therapists' experiences in the Big CACTUS trial; Disability & Rehabilitation; 2021; 1-13

Study details

Secondary publication of another included study- see primary study for details	Palmer R, Cooper C, Enderby P, et al. Clinical and cost effectiveness of computer treatment for aphasia post stroke (Big CACTUS): study protocol for a randomised controlled trial. Trials. 2015;16(1):18
Other publications associated with this study included in review	No additional information.

Aim	To explore the individual accounts of speech and language therapists who implemented the self-managed computer therapy intervention in the Big CACTUS trial.
Population	Speech and language therapists N=11 Speech and language therapists using the computer therapy intervention in the multi-site Big CACTUS trial. Speech and language therapists were eligible to participate in the interviews if their NHS trust was a Big CACTUS trial research site, they had received training on the Big CACTUS approach and had set up and carried out the Big CACTUS intervention with at least one person with aphasia within the 12 months prior to recruitment to this interview study. A total population sample was used with all 21 speech and language therapists invited to participate. The role of all participants in the trial was to implement the intervention by arranging software and hardware resources, training and supporting existing assistants or volunteers, assessing the patients and tailoring exercises in the StepByStep software accordingly. Six participants described themselves as having a level of proficiency in the use of computers in aphasia therapy, with three participants having only limited experience prior to their involvement in the Big CACTUS trial. The study sample represented diversity in geographic locations between rural, urban and mixed rural and urban locations, which was particularly relevant for this community-based intervention where therapists and volunteers/assistants visited people in their homes. Characteristics: Number of years working as speech and language therapists with people with aphasia: 5-10 years - >20 years, median 15-20 years. NHS pay band: median 7 (range 7-8). Location of their speech and language input: Inpatient acute = 6, Inpatient rehabilitation = 6, Outpatient Clinic/day unit = 5, Home visits = 9. Clinical time working with people with aphasia: median 25-50% (range <25% to 50-75%). Mixture of clinical and managerial duties.
Setting	Therapists in the United Kingdom across 21 NHS trusts that were trial sites for the randomised controlled trial.
Study design	Qualitative semi-structured telephone interviews with thematic analysis. The semi-structured interviews followed a topic guide, which outlined key areas to be explored. Topic guide development was informed by the domain identified in the Consolidated Framework for Implementation Research. External and internal piloting of the topic guide was carried out enabling revisions to be made where any limitations in the interview design were found. The interviews were conducted over the telephone by the first author, who had received training in qualitative interviewing and data analysis, with support regarding design, conduct and analysis provided by the co-authors. The interviewer was a speech and language therapist

	independent from the trial, while the co-authors included the chief investigator and researcher working on the trial. The interviewer considered their experience entering the study. The interviews took place at a prearranged, mutually convenient time, to ensure both the researcher and the participant were in a quiet and comfortable environment, where disruptions and distractions could be minimised. Interview length ranged from 30 to 60 minutes. Audio recording was carried out using a digital voice recorder with a telephone pickup microphone. Notes made during the interview were used for feedback at the end of each interview, providing participants with the opportunity for clarification and provision of supplementary information. The participants were assured that the data from the telephone interviews would be anonymised at the point of transcription by the independent researcher and would not be shared directly with their trust.
Methods and analysis	The data set was transcribed in full and analysed concurrently with data collection by the first author. The majority of the coding was completed by the first author, however all authors were involved in the process of interpretation. The first author transcribed the interviews in full to facilitate familiarisation through immersion in the data. Initial codes were generated inductively for the first three transcripts, which were then categorised into themes and subthemes. At this point, the coded transcripts and the initial thematic framework were reviewed by the first author and discussed with the other authors to check that the themes were developing coherently with any disagreements resolved through consensus. Concurrent data collection and analysis allowed for additional probing of areas of interest, for example topic areas in which limited depth or conflicting findings were noted in earlier interviews could be focused upon with additional prompts and more time devoted to that topic in later interviews. Notes and memos were used to record the decisions made during the coding process, to promote reflexivity in the analysis and facilitate transparency. In order to manage the quantity of the data, and facilitate indexing and retrieving text, computer assisted qualitative analysis was utilised and the coded transcripts were important into NVivo 11 software. Coding of the residual transcripts was carried out in NVivo, with refinement of the thematic frame where new codes became apparent. Next, the data within each theme was reviewed for completeness by checking that the latest coding refinements were not adding anything substantial. This decision was achieved through group discussion and consensus. At this stage the framework was consulted and several of the themes identified inductively were related to the constructs identified in the framework, this was therefore used to compose meaningful and descriptive theme names. The final phase involved writing up the findings. Considerations relating to the trustworthiness of the analysis included: using NVivo 11 to code the data; documenting regular team discussions; noting the involvement of multiple researchers throughout.
Findings	**Characteristics of the intervention: complexity and adaptability** Participants identified that the software used was focussed on impairment-based word finding therapy and although it does not assist with the delivery of wider quality of life aspects of aphasia therapy it was perceived as a useful part of the therapy toolkit. They valued the functions of it, including: the ability to personalise the therapy material; tailor the exercises to the individual's impairment; the software's capacity to provide feedback on success directly to the person with aphasia. The participants appreciated the opportunity it provides for intensive self-management practice. Although provision of feedback

	was appreciated, this increased the complexity of setting up the software due to difficulties in getting the speech recognition to provide accurate feedback on devices that may not be fit for purpose (personal and loaned devices). Volunteer/assistant support was perceived to be valuable to encourage and ensure therapy took place, but this required additional time commitment from the therapist to organise and oversee volunteers/assistants. Barriers: Process of personalising software - difficult and time consuming for some speech and language therapists; Getting accurate feedback when using a range of devices is difficult; Time needed to train and support volunteers, and high turn-over of volunteers; Expectations that self-managed therapy can be supported without ongoing oversite by speech and language therapists. Facilitators: Ability to offer independent intensive practice of personalised material with feedback (motivation for provision); volunteer support (enabler for engagement of patients with intervention). **Knowledge and beliefs about the intervention: familiarity with computers and the benefits of training** Beliefs were highly influenced by the individuals computer literacy and their beliefs regarding how the person with aphasia's degree of familiarity with computers impacts upon their ability to engage with self-managed computerised therapy. Despite the usefulness of training, approximately half of participants identified they had experienced difficulties getting to grips with setting-up and delivering the computer therapy. Beliefs held by therapists were that patient motivation and prior familiarity with technology were key factors in patient adherence to therapy and resulting success. Some people with aphasia were perceived to be reluctant to use computer therapy due to a lack of belief in their own ability to use technology. However, experience in the trial challenged these beliefs, and that trying different types of hardware and introducing the therapy at the right time for the patient may be key. Therapists discussed how assistance for people with aphasia was key. However, some believed that the volunteer or assistants required a certain level of skill to perform their role in the way that the therapist intended. Training is key to this.

Barriers: Speech and language therapist competence in using technology generally and StepByStep specifically; Speech and Language therapist concerns about assistant/volunteer competence; Speech and Language therapists assumptions about lack of patient ability to use computer.

Facilitators: Training and upskilling of therapists and assistants; Speech and Language therapists being open minded about the potential ability of patients to use computer; Trying different methods of using a computer to access and control the software.

Patient needs and the service resource dilemma: "is there anything I can be doing on my computer at home?"

An expectation (recommendation) to provide 45 minutes of therapy a day was stated by participants. However, constrained were described by several participants in terms of not having sufficient resources to do lots of one to one therapy sessions anymore, or only having short windows of therapy time with patients after their stroke and so giving less therapy than they would like (e.g. 6 weeks, and one a week for 12 weeks). Participants felt that self-directed therapy was a way of achieving this and a benefit for many patients in terms of having access to some therapy when face to face therapy was limited, having something positive to do in between face to face therapy sessions that focuses on working on aphasia, and in some situations reducing reliance on the therapist. It was also seen as having a place in the long-term management of people with aphasia when other therapy had been completed, recognising the fact that people can continue to improve their language for years. In addition to limited resources and focus on self-management drivers for implementation of self-managed computer therapy approaches, the increasing prevalence of technology use by people of all ages and growing expectations of patients to find something they can do on a computer was seen as an important driver. However, they discussion that this approach isn't right for all people. The therapy was only perceived to be useful/needed by patients for whom word finding was their primary difficulty. Some support needs need to be met by speech and language therapy services that cannot be met by computer therapy and this incurs additional time and resource costs. While people living with informal carers may be able to have support from them, people living on their own required support from assistants or volunteers. The computer software needs to be set up and tailored to the individual. Some people needed regular reviews and speech and language therapist support often involving significant travel time and related costs. The cost of software licenses would require funding by the NHS and may provide challenge. Experiences of hardware availability was mixed in the trial. It was identified that technology in patient's own homes is now relatively common and most people have a device of some description. However, the participants found that many people do not own devices that can run the specific software they require or live in rural areas where poor internet connection limits use of technology for therapy. As therapists

	working for the NHS, some participants highlighted discomfort in their routine practice when not being able to provide the technology for their patients. Barriers: Not for all patients and doesn't address all issues people with aphasia need services for; Mismatch of patient owned devices and devices needed to run software to deliver therapy/poor internet connections; Resource costs: Speech and language therapist time - volunteer/assistant recruitment and training and for set up of software; cost of software and hardware. Facilitators: Insufficient face to face speech and language therapy resource (motivation for alternative ways of providing therapy opportunities); self-managed practice on computer though to be an efficient use of speech and language therapist time - organisation push for self-managed approaches (motivation for provision); people ask for language activities on computer (motivation for provision); speech and language therapist familiarisation with software and involvement of assistants decreased speech and language therapist set up time. **Networks and communications** IT departments' are involved in procuring hardware and software, leaning equipment and making it accessible to use. Difficulties can occur in equipment being loaned out to people in their homes, "locking it down" so that installation of the software was sometimes compromised and requiring standard password protection that can be difficult for people with aphasia to use. Establishing communication with IT departments could be difficult and required persistence. IT departments did not usually have a clear understanding of the context of using technology to provide speech and language therapy services and that the frustrations could be reduced by building a joint understanding of the purpose and forging new working relationships.

Barriers: Departmental processes/policies; communication/negotiations with IT departments; system readiness - networks outside of speech and language therapist not having processes and procedures to support delivery of computerised speech and language therapy.

Facilitators: Developing a shared understanding between speech and language therapy and IT departments; working jointly and building rapport with a consistent individual from the IT department.

Reflecting and evaluating: adaptations for sustainability

All participants perceived that the approach could be adapted to their local context. Solutions to previous issues were discussed, such as using free trial periods offered by some software developers, encouraging self-funding after this time, or exploring charitable funding. One person described an initiative within their NHS trust to facilitate provision of self-managed computer therapy. Participants recognised that using programmes to provide opportunities for self managed practice required ongoing support and should not be seen as a way of reducing existing therapist input. As one of the main adaptation for sustainable implementation in routine clinical practice, participants reflected that they would wish to introduce it over a longer period of time to provide more general support. It was suggested that more of the personalisation could be carried out by a lower grade (junior) speech and language therapist or speech and language therapy assistant to maintain the benefits of the intervention without being too costly. Context was acknowledged to influence adaptations. Participants would investigate having a range of software and apps, devices and platforms available to manage the different language rehabilitation requirements and usability needs of different people with aphasia. Participants saw how it could be applicable to multiple contexts along the stroke pathway and could bridge the gap between different parts of services.

Barriers: Approach not able to add value in local context.

Facilitators: Acknowledge and accept that familiarisation with new software take time; training of whole speech and language therapist team; don't give up, get support from IT department; explore funding and loaning models that work for the local context; iterative process of checking patient capability to use software, followed by use of a few exercises to check patient engaged before investing time in full personalisation and tailoring; Consider software and hardware requirements of individual patients; Consider the contexts in which the approach can add value to the individual service.

Limitations and applicability of evidence	Limitations: The data was collected, transcribed and coded solely by the first author. While all three authors were involved in the interpretative analysis process and writing of the paper, it would have been preferable to have an independent person to check the interpretive process. The sample of participants is small, which may not be wholly representative (particularly with the speech and language therapists taking part in the Big CACTUS trial representing a particular subset of those providing routine care). While this subset of speech and language therapists are more likely to have views on implementation issues as procurement and service set up than junior therapists, it is also possible that junior therapists, being younger on the whole, may be more confident with using technology for therapy potentially influencing perceptions of ease of use and how long it takes to set up. Given the participants chose to deliver the intervention in their NHS trusts for the trial, they may be more positive about the intervention. Applicability of evidence: Generalisable to a United Kingdom practice. Across the NHS, so widely applicable.

Study arms

Speech and language therapists (N = 11)
Speech and language therapists using the computer therapy intervention in the multi-site Big CACTUS trial. Speech and language therapists were eligible to participate in the interviews if their NHS trust was a Big CACTUS trial research site, they had received training on the Big CACTUS approach and had set up and carried out the Big CACTUS intervention with at least one person with aphasia within the 12 months prior to recruitment to this interview study. A total population sample was used with all 21 speech and language therapists invited to participate.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Celinder, 2012

Bibliographic Reference	Celinder, D.; Peoples, H.; Stroke patients' experiences with Wii Sports during inpatient rehabilitation; Scandinavian journal of occupational therapy; 2012; vol. 19 (no. 5); 457-463

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	The aim of this study was to explore **stroke** patients' experiences with Wii Sports as a supplement to conventional occupational therapy in a **controlled** hospital setting.
Population	9 stroke patients aged 51-95 from 2 stroke units in Denmark
Setting	Stroke inpatient hospital in Denmark
Study design	qualitative triangulation design that included semi-structured interviews and field notes.

Methods and analysis	intervention - the Wii intervention was performed individually in a rehabilitation room at the hospital with support an OT. the OT provided physical and verbal support. the intervention lasted a maximum of three weeks with no more than three sessions per week. data collection - Field notes were taken during the intervention and consisted of observations of the patients reactions. Semi structed interviews took place after the study trial. interviews were one on one and lasted approximately 30 minutes. the questions were based on an interview guide. interviews were audio recorded and transcribed verbatim. analysis - transcripts were initially analysed by the first author using content analysis and each transcript was reviewed twice. phrases relevant to study aims were coded in the style of open coding. therapist observations from field motes were used to aid categorisation.
Findings	**Variety** Patients stated that their stroke and hospitalisation made they every day a monotonous routine. they found the Wii intervention added variety by 1) breaking up the day, 2) adding a new topic of conversation and 3) engaging in meaningful occupations. **Engagement** Patients felt the Wii added excitement and provided motivation for rehabilitation to beat their own scores. Male participants particularly expressed feelings of vigour and control while playing the Wii and many expressed a desire to play the Wii again after discharge. **Obstacles and challenges**

	The need for quick reactions was seen as a challenge that caused disappointment and frustration because it stopped the game. patients had trouble with the complex motor tasks of simultaneously handling the controller while pressing the buttons and moving the arm. patients were also challenged cognitively reporting ow demanding and exhausting the sessions were.
Limitations and applicability of evidence	The findings represent experiences of only 9 patients two of whom had only 1 session prior to discharge. The patients were included after interprofessional team agreement which could introduce selection bias. Finally, the presence of cognitive disabilities, including aphasia, minimised the richness of narratives, although field observations partially compensated for verbal limitations or memory lapse.

Study arms

Wii Sports as a supplement to conventional occupational therapy (N = 9)
Nine Danish stroke patients participated, receiving between one and nine interventions with Wii Sports during a three-week period.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Chen, 2020

Bibliographic Reference	Chen, Y.; Chen, Y.; Zheng, K.; Dodakian, L.; See, J.; Zhou, R.; Chiu, N.; Augsburger, R.; McKenzie, A.; Cramer, S. C.; A qualitative study on user acceptance of a home-based stroke telerehabilitation system; Topics in Stroke Rehabilitation; 2020; vol. 27 (no. 2); 81-92

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	Cramer SC, Dodakian L, Le V, See J, Augsburger R, McKenzie A, Zhou RJ, Chiu NL, Heckhausen J, Cassidy JM, Scacchi W, Smith MT, Barrett AM, Knutson J, Edwards D, Putrino D, Agrawal K, Ngo K, Roth EJ, Tirschwell DL, Woodbury ML, Zafonte R, Zhao W, Spilker J, Wolf SL, Broderick JP, Janis S; National Institutes of Health StrokeNet Telerehab Investigators. Efficacy of Home-Based Telerehabilitation vs In-Clinic Therapy for Adults After Stroke: A Randomized Clinical Trial. JAMA Neurol. 2019 6 24. doi: 10.1001/jamaneurol.2019.1604
Aim	To explore the user acceptance of a home-based stroke rehabilitation system.
Population	Stroke survivors N=13 People recruited by referral from their doctors, therapists and hospitals where they received health care services who participated in a randomised controlled trial investigating the use of telerehabilitation to deliver 70 minutes of therapy, 6 days per week over 6-8 weeks. People in the telerehabilitation group were included in this study. Nine participants were accompanied by a caregiver who helped clarify or supplement the answers. Inclusion criteria for the trial: Inclusion: Age at least 18 years at the time of randomisation; stroke that is radiologically verified, due to ischaemic or to intracerebral haemorrhage and with time of stroke onset 4-36 weeks prior to randomization; arm motor Fugl-Meyer score of 22-56 (out of 66, higher is better) at the Screening Visit; Box and Block Test score with affected arm is at least 3 blocks in 60 seconds at the screening visit; Informed consent signed by the subject; Behavioural contract signed by the subject. Exclusion: A major, active, coexistent neurological or psychiatric disease, including alcoholism or dementia; a diagnosis (apart from the index stroke) that substantially affects paretic arm function; a major medical disorder that substantially affects paretic arm function; a major medical disorder that substantially reduces the likelihood that a subject will be able to comply with all study procedures; severe depression, defined as Geriatric Depression Scale Score >10; significant cognitive impairment, defined as Montreal Cognitive Assessment score <22; deficits in communication that interfere with reasonable study participation; a new symptomatic stroke has occurred since the index stroke that occurred 4-36 weeks prior to randomization; lacking visual acuity, with or without corrective lens, of 20/40 or better in at least one eye; life expectancy <6 months; pregnant; receipt of Botox to arms, legs, or trunk in the preceding 6 months, or expectation that Botox will be

	administered to the arm, leg, or trunk prior to completion of the 30 day follow-up visit; unable to successfully perform all three of the rehabilitation exercise test examples; unable or unwilling to perform study procedures/therapy, or expectation of noncompliance with study procedures/therapy; concurrent enrolment in another investigational study; non-English speaking, such that subject does not speak sufficient English to comply with study procedures; expectation that subject cannot participate in study visits; expectation that subject will not have a single domicile address during the six weeks of therapy; within 25 miles of the central study site and with Verizon wireless reception. Characteristics: Male:Female = 11:2. Side of stroke - Left:Right = 6:7. Mean age (range): 70 (52-86) years.
Setting	The study was conducted in Southern California, United States of America. Nine of the interviews were conducted in the participants' homes where the devices had been installed, and four interviews were conducted at the university enrolment site. People were recruited by referral from their doctors, therapists, and hospitals where they received health care services.
Study design	A qualitative study design the involved in-depth semi-structured interviews with 13 patients with stroke who were enrolled in a clinical trial of arm motor rehabilitation therapy and were randomised at University X to receive a six-week intervention program using a novel home-based telerehabilitation system designed to improve motor recovery and patient education after stroke. All interviews and data analyses were performed blinded to all study-related assessments.
Methods and analysis	All interviews were transcribed verbatim. They removed identifiable data and replaced patient names with pseudonyms to protect participant's privacy. They input the transcripts into DeDoose, a web application for qualitative data analysis. They analysed user acceptance of the telerehabilitation system based on the Unified Theory of Acceptance and Use of Technology, a model of information system/information technology acceptance and use. The model describes four factors that would influence a user's attitude, behavioural intention and use behaviour of an information system or information technology: performance expectancy, effort expectancy, social influence, and facilitating conditions. We present findings about these four factors when patients used the telerehabilitation system. Based on the results of open coding related to UTAUT about using the telerehabilitation system, we report the themes and sample interview quotes in the next section.
Findings	**Performance expectancy** *Perceived improvement in physical abilities*

People reported improvement in their physical conditions after the six weeks of therapy. Some demonstrated enhanced dexterity, strength and endurance by comparing how their arms functioned at the end of therapy in contrast with what they were like before therapy. Among all components of the system, all people rated highly their experience using the videoconference, which provided a channel for therapists to observe, correct and provide feedback and encouragement. First, people emphasized that they were able to obtain feedback from the therapist on their exercise. During the session, the therapist would go over many games and exercises with the patients and watch participant movements, and they could verbally correct exercise performance, make adjustments and answer questions. Afterwards, offline, therapists could adjust game choices or game difficulty parameters to adapt to a person's progress and preferences. People also liked that video-conferencing provides a visual feedback to the therapists to adjust the games and adapt to their preferences.

Perceived improvement in mental wellbeing

Some people also experience enhanced cognitive skills through playing games. In addition, the education component also helped them learn about stroke that they were unaware of before. For most people, the questions were rated as easy but nonetheless also helped them exercise their cognitive abilities. Some people reported enhanced memory after playing the games.

Perceived improvement in social-emotional wellbeing

Some people also felt more socially connected after using the system. They considered talking to the therapist as a way to socially connect with others. They described becoming more isolated after their stroke, often caused by their limitations in mobility. However, the video-conferencing allowed them to talk to their therapist and therefore feel more connected. Most patients established a personal connection with the therapist through use of the telerehabilitation system. By doing so, they felt less isolated and more positive and connected.

Effort expectancy

Perceived engaging experience

All people agreed that playing games made the rehabilitation experience more enjoyable. In particular, participants liked the variety of the games they had been exposed, such as poker, shooting, and driving games. Through choosing and playing a variety of games, people perceived the exercises to be more engaging compared with conventional repetitive rehabilitative exercises.

Motivation to conduct the exercises

People reported both external and internal motivation for performing their exercises. Externally, communicating with therapists three times a week held patients accountable for conducting the exercises. Several people mentioned that even though they were aware that their previous rehabilitation therapy exercises, prescribed prior to study participation, were essential for recovery, sometimes they had been too tired or busy, and therefore in the past they had tended to skip sessions at times. However, during study participation, they knew that a therapist would connect and talk with them, and so they felt more obliged to complete their assignments, including in comparison to working with the system by themselves. Internally, witnessing their progress over time helped participants maintain continued use of the telerehabilitation system. In particular, they noticed the progress when they could play the games faster, easier, and with higher scores, when they observed improvement in conducting their activities of daily living, and when they received evaluation and feedback from their therapists. Overall, the external and internal motivation that drove patients to stay in the telerehabilitation program reduced their perceived effort for engaging in this rehabilitation program.

Convenience in home-based rehabilitation

All people commented that being able to conduct rehabilitation at home has made rehabilitation more convenient compared with having to travel to a healthcare professional. They could also adjust the time in using the system, which is more convenient then scheduling a specific time with the therapist. The convenience in location and time led to have higher doses of therapy compared to that achieved when having to travel to a therapist at a scheduled time. Using home-based

rehabilitation systems also saved effort for some caregivers. Therefore, the home-based telerehabilitation system saved users' effort in traveling to the therapists at specific time and freeing caregivers from accompanying them.

Facilitating conditions

Some people wished that they could have better facilitating conditions in terms of technical issues, physical space and schedule. Three reported minor technical issues at the beginning of the study but appreciated that they were able to receive support in time. Being provided a channel where they could always reach out for technical support was considered essential for both patients and caregivers. Some had limited space in their homes. Therefore, despite all the benefits of the telerehabilitation systems, they found it inconvenient at times. The third facilitating factor is the time. Two participants mentioned that even though they were able to receive larger dose of therapy compared to visiting the therapist, they also mentioned time constraints. One found that had to suspend some daily tasks if they were going to use the telerehabilitation system for six days a week. They wished for a less intense schedule, such as two days a week.

Social influence

Three participants mentioned social influence when using the system. Besides caregivers, social influence mainly came from family members. Even though the system was used by a single user and not in a social model, they reflected being able to receive attention from their friends and family motivated them to continue engaging in their therapy using this system.

Behavioural intention

Most people agreed that they would want to use the system in the future. However, people also expected a number of improvements to enable long-term usage, particularly improved ability to adapt game difficulty and to show progress over time. First, participants expected that the difficulty of the games and exercises could be adapted to their progress over time. If they were to continue using the system in the long run, the system would need to keep challenging them. Second, people

	wished to visually see their progress over time. People were motivated when they subjectively experienced progress or their caregivers observed the progress. However, they also wished to view their data in the long run to motivate them to make continuous improvement.
Limitations and applicability of evidence	Limitations: None stated in the study. Limited sample size, all participants received telerehabilitation allowing no comparison to people receiving face to face rehabilitation. Applicability of evidence: Mostly applicable. Based in the United States which has a private healthcare system and so may not be generalisable to a United Kingdom setting (in terms of funding technology amongst other elements).

Study arms

Stroke survivors (N = 13)
People recruited by referral from their doctors, therapists and hospitals where they received health care services who participated in a randomised controlled trial investigating the use of telerehabilitation to deliver 70 minutes of therapy, 6 days per week over 6-8 weeks. People in the telerehabilitation group were included in this study.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Cherry, 2017

Bibliographic Reference	Cherry, C. O.; Chumbler, N. R.; Richards, K.; Huff, A.; Wu, D.; Tilghman, L. M.; Butler, A.; Expanding stroke telerehabilitation services to rural veterans: a qualitative study on patient experiences using the robotic stroke therapy delivery and monitoring system program; Disability & Rehabilitation Assistive Technology; 2017; vol. 12 (no. 1); 21-27

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
Aim	To determine participants' general impressions about the benefits and barriers of using robotic therapy devices for in-home rehabilitation.
Population	Stroke survivors N=10 Veterans aged 45-90 who had experienced a unilateral ischaemic or haemorrhagic stroke. Inclusion: Persistent hemiparesis as indicated by a score of 1-3 on the motor arm or leg item of the National Institutes of Health Stroke Scale; either hand function or foot function significantly limits activities of daily living; functional independence measure score of between 17 and 88; the presence of some upper or lower extremity voluntary activity as indicated by the ability to move proximal and/or distal joints against gravity; no receptive aphasia, as indicated by a score of 0 on Best Language item of the NIHSS; ability to read and follow simple directions; access to telephone, either cell or landline; no

	injury or conditions that limit use of the more affected side before the stroke; resides in a rural or highly rural location based upon zip code in database of VISN 7. Exclusion: Clinically significant fluctuations in mental status within 3 days of enrolment; not independent before stroke; extinction and inattention (formerly neglect) score greater than 0 on item 11 of the NIHSS; sensory loss = 2 on the sensory item 8 of the NIHSS; no Botox injections within 6 months of enrolment; not expected to survive one year due to other illnesses (i.e. cardiac disease, malignancy). Participant characteristics: Mean age (range): 62 (49-88) years. Male:Female = 10:0. Side of stroke - left:right = 7:3. Time since stroke (range): 2 months, 5 days - 4 years, 1 month, 3 weeks, 2 days. Married = 6, divorced = 1, single = 3. Employment: Retired = 4, disabled = 9. Living with others = 9. Living alone = 1.
Setting	In the persons home. Conducted in the VISN 7 Rural Districts of Blairsville, Georgia and Carrollton, Georgia and surrounding areas. People were recruited from a convenience sample and were introduced to the project by their clinician, who was their primary care doctor, nurse practitioner or physical therapist at the veterans association Hospital or community based outpatient clinics where they accessed care. Participants all received rehabilitation with an in-home robotic rehabilitation device (Hand Mentor TM device or Foot Mentor TM device). Participants were assigned 2 hours of daily therapy over a maximum duration of 3 months and were asked to use the device even if formal therapy had already begun or was ongoing. Daily training programs (similar to computer games) were available, focussed on motor control and spasticity reduction.
Study design	Direct observation and semi-structured interviews. Direct observation was conducted during in-home site visits by two interviewers trained in ethnographic research methods. During site visits, the interviewers took notes on the key areas outlined. Their observations focused on proximity to a healthcare centre, participants' accessibility to public transportation, the home environment, availability of a caretaker and other means of social support. The notes taken during the visit were typed and stored in electronic files and reviewed during data analysis. The interviewers also discussed their observations immediately following each visit to ensure consistency of findings.

	Interviews were conducted with the participants during the site visit following the protocol. One researcher took the lead in asking questions, while the second researcher took notes. the interviews were digitally recorded with permission from the participants, and excepts of the interviews were transcribed verbatim. The presence of both interviewers during all 10 interviews ensured consistency. The average duration of the interviews was 32 minutes.
Methods and analysis	The interview transcripts were input into NVivo qualitative data analysis software. Observational and interview data were inductively analyzed by creating codes organized around key themes and subthemes. As the coding progressed, subthemes were identified and grouped within overarching themes as patterns emerged about how the codes related to one another. The interviewers discussed overarching themes after each of the interviews were conducted, allowing them to identify emerging themes and areas that required further exploration. For example, as the interviews progressed it was agreed by both interviewers that thematic saturation had occurred regarding the positives and benefits of the device, but there were less data on the barriers and negatives of the device. Therefore, prompts focusing on negatives and barriers were emphasized during the last few interviews.
Findings	**Benefits of use** *Mobility* Overall people had an increase in mobility from the use of the devices. In some cases this difference was noticed by the caregivers or therapists, rather than the person themselves. In many cases, people noticed an improved mind-body connection from using the device. The games reportedly improved the memory of their arm or leg without users being explicitly conscious of the process. *Sense of control over therapy* Due to being able to use it in their home, people gained a sense of control over the scheduling of their therapy. The ability to split up sessions was important for many participants, especially at the beginning when they would more easily tire from using the device. The ability to use the device in the home was also very important because of the multiple barriers that participants faced due to their often remote locations. The participants expressed the convenience of using the devices in

their homes rather than traveling to therapy (counteracting the difficulties of getting to therapy appointments). Several caregivers and participants described the long distances from their homes to the hospital through hand to traverse rural roads and heavy urban traffic. Furthermore, many of these areas lacked public transportation, and when public transport was available it often added hours to the already long travel time. A few expressed their preference for using the device rather than doing in-person therapy. Some participants felt that using the device reduced frustrations that occurred when their caregiver, often their wife would act the role of therapy coach.

Outlet for physical and mental tension and anxiety

Users felt that using the device reduced both physical and mental challenges. Physical tension occurred for some participants in form of stiffening or shaking in their limbs, that the device reduced. Mental tension and anxiety was expressed by some as they worried about the rate of their recovery, becoming frustrated by their new physical or mental limitations, or had anxiety thinking back to when the stroke occurred. People felt using the devices reduced these mental issues because they found the device fun and challenging, and using it decreased boredom and gave them something to look forward to.

Increased independence and mood improvement

People expressed an increased sense of independence from their newfound mobility for which they credited their use of the device. Caregivers discussed how increased independence has improved the mood of veterans. One caregiver recalled that her husband's depression had improved through the use of the device.

Barriers to use

	Size and placement One of the complaints was the size and weight of the device, and the difficulty moving them around the home as a result. Most reported they did not move the device from where it was originally set up. Direct observations revealed other barriers related to the physical nature of the devices themselves. Many of the homes were crowded with limited room, few available electrical outlets or without a table or chair at proper height. As a result setting up the device was difficult. *Wearing and adjusting the device* The most consistent barrier to using the devices reported by participants was difficulty putting the device on and adjusting it by themselves. In some cases, having enough room to fit a shoe was a problem. Another complaint involved the velcro on the foot device. Several of the participants said that they needed the help of the caregiver in order to put on the device. *Technical difficulties* One technical complaint centered on the computer or software becoming unresponsive or acting erractically. A second technical difficulty for some was that the modem that was used to send their usage data to the hospital did not always function properly. The modem reportedly took a long time to transmit the data and sometimes did not send the data at all. In some cases the participants blamed the remote area they lived in for these difficulties since many of the rural areas lack consistent Internet access. Although participants reported some technical difficulties, everyone reported that the devices were "easy to use" even though many had limited previous knowledge of and experience with computers or gaming devices.
Limitations and applicability of evidence	Limitations: The sample size was 10 users and their caregivers which was small and may have introduced bias. For some, visits to observe and interview them were conducted after the intervention had already finished, which may have introduced recall bias.

	Applicability of evidence: Somewhat applicable. Completed in a USA setting so may not necessarily being applicable to a UK healthcare setting. Discusses people in rural areas so may not be as applicable to people in urban areas who may live closer to healthcare settings.

Study arms

Stroke survivors (N = 10)
People with persistent hemiparesis with either hand or foot function that significantly limits activities of daily living

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Clarke, 2018

Bibliographic Reference	Clarke, D. J.; Burton, L. J.; Tyson, S. F.; Rodgers, H.; Drummond, A.; Palmer, R.; Hoffman, A.; Prescott, M.; Tyrrell, P.; Brkic, L.; Grenfell, K.; Forster, A.; Why do stroke survivors not receive recommended amounts of active therapy? Findings from the ReAcT study, a mixed-methods case-study evaluation in eight stroke units; Clinical Rehabilitation; 2018; vol. 32 (no. 8); 1119-1132

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	Clarke, D. J.; Tyson, S.; Rodgers, H.; Drummond, A.; Palmer, R.; Prescott, M.; Tyrrell, P.; Burton, L.; Grenfell, K.; Brkic, L.; Forster, A.; Why do patients with stroke not receive the recommended amount of active therapy (ReAcT)? Study protocol for a multisite case study investigation; BMJ Open; 2015; vol. 5 (no. 8); e008443
Aim	To develop an in-depth understanding of therapy provision in stroke units in England, including how clinical guideline recommendations are interpreted and implemented by therapists, and experienced by patients and their carers
Population	Stroke survivors, carers and stroke service managers, therapists and other multidisciplinary team members Stroke survivors N=77 Aged 18 years or over; confirmed primary diagnosis of new stroke; receiving active therapy provided on the stroke unit 34 (44.2%) male. Ethnicity: White = 74 (96.1%), Asian - Bangladeshi = 1 (1.3%), Other Asian background = 1 (1.3%), Black - Caribbean = 1 (1.3%). Mean age (SD): 69.42 (13.51) years. Stroke classification: Left hemiparesis = 45 (58.4%), right hemiparesis = 26 (33.8%), other = 6 (7.8%). Speech and language ability: Normal language = 35 (45.5%), Dysphasia = 23 (29.9%), Dysarthria = 30 (39%). Mean NIHSS score on admission to hospital (SD): 10.2 (6.48). Mean length of inpatient stay in days (SD): 34.32 (25.04) days. Usual living arrangements: Lives alone = 32 (41.6%). Lives with relative/carer = 45 (58.4%). Discharge destination: Own home = 48 (62.3%). Relative's home = 1 (1.3%). Nursing care = 13 (16.9%). Residential care = 8 (10.4%). Died = 7 (9.1%). Carers N=53

	Aged over 18 years; a family member/close friend of a stroke survivor receiving active therapy provided on the stroke unit 20 (37.7%) male. Ethnicity: White = 53 (100%). Mean age (SD): 59.55 (13.62) years. Carer relationship to stroke survivor: Partner = 27 (50.9%). Child = 19 (35.8%). Parent = 4 (7.5%). Grandchild = 1 (1.9%). Other relative = 2 (3.8%). Healthcare professionals N=197 Stroke service managers, registered therapists (physiotherapist, occupational therapist, speech and language therapist) or other multidisciplinary team member working on the stroke unit for three or more days in each week (or equivalent level of contact for stroke service managers). 198 people were observed, 131 people were interviewed. 31 (15.7%) male. Ethnicity: White = 180 (91.8%). Mixed - White and Asian = 2 (1%). Indian = 3 (1.5%). Pakistani = 5 (2.6%). Chinese = 1 (0.5%). Other Asian background = 3 (1.5%). Black - African = 1 (0.5%). Mean age (SD): 35.96 (10.63) years. Professional background: Physiotherapy = 71 (40%). Occupational therapy = 50 (24.4%). Speech and language therapy = 43 (21.8%). Generic therapy assistant = 8 (4.1%). Nurse = 10 (5.1%). Physician = 7 (3.6%). Non-clinical management = 8 (4.1%). Experience level: Student = 15 (7.6%). Unqualified therapy assistant = 33 (16.8%). Qualified junior therapist = 51 (25.9%). Experienced therapist or nurse = 39 (19.8%). Senior therapist/senior nurse/manager = 52 (26.4%). Consultant physician = 7 (3.6%).
Setting	Over 1000 hours of non-participant observations, including 433 therapy sessions with 197 staff, 77 patients and 53 carers. Interviews with 131 staff, 49 patients and 50 carers. Conducted with people purposively sampled from eight stroke units in four English regions (in the north of England) to include a mix of hyperacute, acute and rehabilitation units, with higher and lower national audit ratings for therapy performance.
Study design	A multisite ethnographic case study design. Data generation in each site will include modified process mapping, non-participant observations and documentary analysis. These were followed by in-depth semistructured interviews with therapists and managers and with patients and informal carers. A purposive, non-probability sampling approach was used. They used a typical case sampling approach to the selection of stroke units and a heterogenous sampling approach to staff, patient and informal carer sampling in order to explore therapy provision in stroke units with characteristics likely to be similar to others in the UK. They used a sampling

	frame created based on high and low performance ratings in SSNAP reports (July-September 2013) for therapy provision against the 45 minute standard with a mixture being included. Within each site purposive sampling was used to identify potential participants who had inpatient, informal carer, clinician or managerial experience in the stroke unit. Process mapping was used to examine part or all of the patient journey through a particular inpatient, outpatient or diagnostic service with the objective of understanding patients' experiences. This was modified for the study, using it to develop insight into how therapists in each stroke service assess need for and then manage provision of therapy. This was developped in meetings with 10-15 stroke unit team members in each unit. They then identified points in the patient journey at which specific aspects of therapy practice are informed by National Clinical Guidelines, informed by individual patient needs and/or influenced by local organisational contexts. They then mapped this to the non-participant observations of stroke unit processes and individual therapy sessions.
Methods and analysis	Data was gathered through non-participant observation and semistructured interviews. Non-participant observation was used. Observations had two elements: an initial focus on stroke unit contexts and then becoming progressively more focussed on specific aspects. A qualitative observational framework was developed and adapted for this study. Semi structured interviews were conducted with up to 10 patients and their informal carers in each unit, normally in their own homes 4-6 weeks after discharge using a topic guide. Interviews focussed on expectations of therapy, patients recollections of the frequency and content of therapy and informal carers' perceptions of therapy frequency and contribution of therapy to recovery. Patients and informal carers were offered the opportunity to be interviewed jointly or separately. Semi structured interviews were also conducted with a minimum of 15 therapists, other MDT members and stroke service managers. Sampling of interviewees was guided by individual unit observations and includes those responsible for service delivery and evaluation; therapists with different levels of experience and other MDT members engaged in facilitating, providing or continuing therapy, related to the 45 minute recommendation. An interview topic guide was used. Perceptions and experiences of working towards the recommendation were captured. Interviews explored the decision-making processes used when planning therapy (including prioritisation, mode, format, intensity,

	personnel delivering) for patients with differing severities of stroke impairment, or therapists' decisions not to provide therapy. Interviews explored issues relating to service structure including, where appropriate, 6 or 7-day therapy services, hours of working and staff skill mix. Data analysis combines the process mapping, field notes, observational records and interviews. These were transcribed and entered into a qualitative data analysis tool NVivo (V.10.0). Data was analysed using the Framework approach. Data was analysed by four researchers. Observational, documentary and interview data was coded; related codes were grouped together under thematic headings that captured and explained the relationship between coded elements of text. Emerging explanations arising from the data were explored further during fieldwork; and more examples sought in observations of current and of subsequent units. Researchers met to discuss data analysis every 4-6 weeks and reported findings to an expert advisory group. They used the following approaches to demonstrate trustworthiness and quality: the clear documentation of the research process (methods, analysis and any problems encountered and solutions found); transparency about the development of the thematic framework and matrices and their use in analysis; documentation of the contextual features in which the research was carried out; the exploration of contradictory cases and alternative explanation and discussions of emerging findings among the research team. Once data analysis was completed in the participating stroke units, groups of people from all backgrounds who had not been previously involved in the study were invited to participate in up to three separate consensus meetings lasting up to 2 hours on each occasion. The research team presented the findings and provisional recommendations and then, using an iterative process across the meetings, engaged participants in discussion to refine the study recommendations. Meetings progressively focused on how barriers may be prevented or addressed and how facilitators and good practice can be effectively shared nationally. The output will be stakeholder consensus on recommendations to support delivery of optimum levels of stroke therapy provision in stroke units.
Findings	7 factors influencing therapy provision: **1) Time spent in information exchange**

The most significant factor was the time therapists routinely spent in information exchange activities. These included daily handovers or board rounds where typically, one nurse delivered information to individual therapists or groups of therapists on a unit. Each handover tended to report on all patients and lasted between 15 and 60 minutes (mean=32.5, SD=12.25). Reported information covered new patients, changes in existing patients and planned discharges. Observations indicated that outside of hyper-acute units which had high turnover and length of stay of less than 72 hours, information exchange activities were repetitious and not always therapy focused. In five units, individual therapists attended routine nurse-led handovers at the start of the daytime shift, before handing over the same information to all other occupational therapists and physiotherapists in an additional session. In two rehabilitation units, board rounds attended by one or two nurses and all therapists occurred daily (for approximately 1 hour). Speech and language therapists attended nurse-led or therapist-led handovers only in Units 2 and 8.

In the remaining site (Unit 7), two therapists started work 30 minutes before others, receiving a nursing handover from one nurse (10-15 minutes) and then preparing a daily therapy provision schedule (timetable) for all occupational therapists and physiotherapists. No further handover occurred and individual therapy was provided according to the timetable; SSNAP data demonstrated that more therapy minutes were routinely delivered in this unit. The mean observed time spent in daily handovers ranged from 34 minutes (Unit 7) to 5.2 hours per therapist per week (Unit 1). Some therapists reported handovers were valuable provided that the process was based on exchange of information and not simply receipt.

Additional information exchange activities included MDT and goal-setting meetings. Typically, only one qualified therapist per discipline attended MDT meetings but delays to start times and meetings over-running were common. These meetings took up large amounts of therapists' time in units 1, 4, 5 and 6 where multiple consultant physicians each held weekly MDT meetings. When mean time spent in MDT and goal-setting meetings is added to each spent between 1.2 and 6.5 hours per week in information exchange activities, with most spending 3-5 hours per week.

2) Time spent in other non-patient contact activities

This included planning therapy, documenting therapy provided; discharge planning, ordering equipment and transport; developing patient and family/carer training and information packages; supervising and training staff. Discharge planning for

patients with complex needs increased administration, which therapists (usually occupational therapists) prioritised over face-to-face therapy. In six units, therapy was documented in shared MDT notes. Unit 8 used electronic patient records (EPRs) with no obvious reduction in documentation time. Speech and language therapists in six units duplicated therapy provision documentation in departmental records. In units where therapy timetabling occurred (5, 7, 8), documentation time (10-15 minutes) was factored into hour-long scheduled 'slots'; in the remainder, documentation mainly occurred before 09.30 or after 15.30.

The most time-consuming other non-patient contact activity was duplication of documentation; completion of SSNAP and internal audit records is an example of this duplication. In all units, including that using EPRs, therapists recorded therapy minutes provided per patient on paper records. These were also entered into the online SSNAP audit and into internal audit systems, for example, SystmOne. These systems do not allow data sharing. In four units, dedicated clerks entered data, in others therapists or nurses completed data entry.

3) Staffing levels and deployment

Occupational therapists and physiotherapists were commonly co-located on stroke units; for speech and language therapists, this occurred in only two units (7 and 8). In all sites, speech and language therapists covered more than one ward; in five, they provided services for the whole hospital and community. We found marked between unit variations in therapist numbers. In all but one unit, these were lower than recommended, particularly for speech and language therapists. The two units (Units 7 and 8) with the highest therapist numbers had the highest ratings (AAA) for SSNAP therapy domains. Even in those units, maintaining or increasing staffing levels and providing therapy consistent with guideline recommendations was challenging. In seven of eight units, therapists worked 08.00/08.30 to 16.00/16.30 but rarely provided therapy before 09.30. There were exceptions; occupational therapists in Unit 4 conducted mealtime assessments from 07.30 to 08.00, and in Unit 7 washing and dressing practice occurred before 08.00. Protected patient mealtimes (1 hour) and staff meal breaks (30 minutes taken before protected mealtimes) reduced time available for therapy in seven units. In six units, documentation was typically completed after 15.30; little therapy was delivered after this time. In Unit 7, therapists' start, finish and mealtimes were staggered to extend the working day; protected patient mealtimes were reduced (30 minutes). Therapists or therapy assistants were observed supporting patients at mealtimes. While no therapist

in Unit 7 worked longer than 7.5 hours per day, they delivered more therapy minutes and achieved 'A' rating for physiotherapy, occupational therapy and speech and language therapy.

Six units provided seven-day occupational therapy and physiotherapy and two provided speech and language therapy on six days. Weekend therapy provision occurred mainly in hyper-acute services and focused on meeting SSNAP targets that newly admitted patients should be assessed and managed by at least one member of the specialist rehabilitation team within 24 hours, and all relevant members within 72 hours. In three units, weekend services were covered by stroke unit staff and therapists from the wider hospital/community, or stroke unit staff working overtime. In the other three units, the stroke unit team covered seven-day services; therapists took weekdays off in lieu, which depleted their numbers.

Providing seven-day services did not appear to increase therapy frequency and intensity in any unit.

4) Patient factors

Patient factors divided into two categories: 1) those relating to patients' condition and 2) those relating to patients' physical readiness and availability to participate in therapy. Category 1 factors identified by therapists included clinical instability, post-stroke fatigue and concurrent medical illness. Experienced therapists reported these factors did not mean therapy would be withheld. Instead, they discussed intervention safety with medical and nursing colleagues, completed individual assessments and adapted therapy accordingly.

Therapists frequently provided shorter, less intensive treatments for fatiguing patients, reporting that ideally they would return to them later the same day to provide an appropriate overall therapy 'dose'. However, our observations indicated this rarely occurred. Some therapists described conflict between their clinical judgement that these patients could not tolerate

longer, more intensive sessions, and their awareness of the guideline recommendation for 45 minutes of therapy daily, fearing the negative impact that regularly recording single short episodes could have on SSNAP performance ratings.

Category 2 factors included patients' physical preparedness and availability to participate in therapy. Ensuring patients were ready for therapy was largely viewed as a nursing role. Numerous factors impacted on the process of ensuring patients were out of bed, had received meals and medication and were appropriately dressed for scheduled therapy. Nursing staff reported better communication could support them in their role. As staffing levels were often less than recommended, this influenced patient preparation; nurses prioritised other tasks.

5) Limited knowledge of the evidence for increased frequency and intensity of therapy

Although all therapists were aware of the recommended daily therapy minutes, few were aware of the evidence underpinning the recommendations, or discussed how this informed clinical decision-making and therapy provision. The evidence that more therapy more often is associated with improved outcomes was rarely referenced during observations or in interviews. On occasion, a contradictory perspective was voiced, "I don’t see how you can ever set a standard, your standard has got to be that the patient has whatever therapy is appropriate and that is not going to be the same every day. […] We’ve got to get out of this habit that just because a patient needs physiotherapy that the more they have, the better it is, that’s completely wrong thinking. (Physiotherapist, Unit 5)".

However, some therapists' views indicated knowledge of the evidence underpinning recommendations. "The 45 minutes, doesn’t always fit with my, our model of working, it’s not specific to OT necessarily where it came from, some of the evidence that they’re basing on is very physio-orientated, rather than this type of ward, rehab people going in and out on visits. (Occupational therapist, Unit 2)". All therapists referred to clinical reasoning as the basis for decision-making regarding therapy frequency and intensity. In each unit, this followed patient assessment involving direct observation, 'hand-on' assessment, pencil and paper testing (of language, cognition), verbal/written information from colleagues regarding patient engagement, and from patients and their families about pre-stroke functioning. Clinical reasoning was discussed in terms of deciding whether patients were suitable for therapy on specific days and appropriate interventions. Patients' engagement in and tolerance of particular interventions appeared to be the primary determinant of subsequent therapy

provision. Therapists relied on tacit understanding of improvement with limited reference to or observed use of validated outcome measures.

6) Influence of external audit

Therapists described an ambivalent relationship with national audit requirements. They recognised the contribution that the SSNAP has made in improving stroke services, and the value of the therapy provision target. However, therapists viewed audit of therapy provision as different to other audited targets (with dichotomous responses), for example, whether computerised tomography scanning was completed within 1 hour of hospital arrival. There was disquiet across disciplines and sites that provision of individualised therapy, and indirectly, the quality of therapy services, was measured and performed-rated against a numerical target. Despite these reservations, a concern to achieve the '45-minute' target dominated the thinking of senior therapists and therapy service managers, who accounted for SSNAP performance ratings to hospital managers and service commissioners. In contrast, inexperienced therapists, who provided a substantial proportion of therapy, often had very limited understanding of the guideline recommendations, the underpinning evidence, the purpose of the SSNAP or the wider purpose of clinical audit. They recorded therapy minutes data routinely but without a clear sense of the purpose or importance of these data.

The SSNAP defined therapy as assessment and/or treatment (individual or within a group), provided by qualified therapists or supervised assistants. However, therapists across sites were uncertain about what should and should not be recorded. This impacted on the number of minutes recorded and whether time spent treating a patient was recorded in the SSNAP at all. One example involved therapy to maintain function while awaiting discharge. This was recorded in some units while in others, lead therapists actively directed colleagues not to record these minutes. Similarly, some speech and language therapists were unclear whether time spent documenting their recommendations and advising other staff or patients' families should be recorded. Although the SSNAP provides comprehensive information about completing the audit to registered staff via online help pages, few therapists were aware of this or how to access it.

Observations indicated over-estimation and error in SSNAP data entry. We observed 433 therapy sessions and accessed SSNAP data for 364. Therapists did not routinely record session start and finish times, typically estimating times after

wards. On average, sessions recorded by physiotherapists, occupational therapists and assistants were 5.48 (S=12) minutes longer than observed. Recording accuracy varied between units and professions. Speech and language therapists recorded a mean session length of 30.34 minutes (SD=12.82), while observed length was 18.98 minutes (SD=10.5). Where group therapy was provided (five units), therapists recorded a mean of 56.51 minutes (SD=15.45), compared to an observed mean of 47.28 minutes (SD=14.54).

The SSNAP shaped many therapists' behaviour; their focus was on increasing recorded therapy minutes to improve performance ratings, rather than on providing more patients with more therapy more frequently. Practices developed specifically to improve performance ratings were observed. These included routine use of joint working, with therapists from different disciplines treating a patient requiring multiple staff for manual handling, and therapy minutes recorded for each discipline 'active' in a session. Therapists perceived joint-working to increase efficiency, allowing them to record more minutes; however, it effectively reduced the amount of daily time patients spent in therapy. Group therapy was sometimes used strategically to increase the number of patients treated. In some units, the therapeutic value of groups was clearly evident and the number of minutes recorded for each discipline appeared appropriate. In others, groups appeared to provide only social stimulation; the number of minutes recorded was questionable in terms of therapeutic value and therapist involvement. Although most senior therapists understood the primary purpose of the SSNAP as providing data to drive service improvement, use of data for this purpose varied across sites. However, Units 7 and 8 had used their data in business cases to demonstrate the need for and achieve increased staffing levels. They reported that this contributed, alongside other service improvement initiatives, to increase therapy provision.

7) Limited use of therapy timetabling

Therapists commonly understood 'timetabling' to mean weekly allocation of patients' treatment sessions with assigned staff members, at specified times. This occurred in four units: two timetabled daily and two (rehabilitation units) held weekly timetabling meetings. However, whether labelled timetabling or not, therapists in all units spent time planning which patients would receive therapy and who would provide it. A concern highlighted by therapists not timetabling weekly was the perceived time commitment. In practice, when totalled, we observed little difference between weekly (90-120 minutes) and daily timetabling (90-150 minutes). Therapists felt daily timetabling should happen after nurse handover so they had

	information about who was appropriate for therapy. This often delayed planning until 10a.m. In seven sites, all physiotherapists and occupational therapists were involved in daily or weekly planning activity. Two units shared weekly-prepared timetables (on laminated cards) with staff, patients and relatives. Observed benefits included nurses using timetables to prioritise their workload to ensure patients were physically prepared, and staff not involved in timetabling (speech and language therapists, dieticians and doctors) using schedules to work around planned therapy. The net effect of shared timetables was that patients were available for therapy, therapists did not compete for the same time-slot, few sessions were missed and more minutes could be provided.
Limitations and applicability of evidence	Limitations: A limitation was that most services were located in the North of England; inclusion of units in other regions may have generated different findings. Applicability: Directly applicable. UK based study across multiple stroke units of different types across the North of England.

Study arms

Stroke survivors (N = 77)
Aged 18 years or over; confirmed primary diagnosis of new stroke; receiving active therapy provided on the stroke unit

Carers (N = 53)
Aged over 18 years; a family member/close friend of a stroke survivor receiving active therapy provided on the stroke unit

Healthcare professionals (N = 197)
Stroke service managers, registered therapists (physiotherapist, occupational therapist, speech and language therapist) or other multidisciplinary team member working on the stroke unit for three or more days in each week (or equivalent level of contact for stroke service managers). 198 people were observed, 131 people were interviewed.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Clarke, 2015

Bibliographic Reference	Clarke, D. J.; Tyson, S.; Rodgers, H.; Drummond, A.; Palmer, R.; Prescott, M.; Tyrrell, P.; Burton, L.; Grenfell, K.; Brkic, L.; Forster, A.; Why do patients with stroke not receive the recommended amount of active therapy (ReAcT)? Study protocol for a multisite case study investigation; BMJ Open; 2015; vol. 5 (no. 8); e008443

Study details

Secondary publication of another included study- see primary study for details	Clarke, D. J.; Burton, L. J.; Tyson, S. F.; Rodgers, H.; Drummond, A.; Palmer, R.; Hoffman, A.; Prescott, M.; Tyrrell, P.; Brkic, L.; Grenfell, K.; Forster, A.; Why do stroke survivors not receive recommended amounts of active therapy? Findings from the ReAcT study, a mixed-methods case-study evaluation in eight stroke units; Clinical Rehabilitation; 2018; vol. 32 (no. 8); 1119-1132
Other publications associated with	No additional information

this study included in review	

Cobley, 2013

Bibliographic Reference	Cobley, C. S.; Fisher, R. J.; Chouliara, N.; Kerr, M.; Walker, M. F.; A qualitative study exploring patients' and carers' experiences of Early Supported Discharge services after stroke; Clinical Rehabilitation; 2013; vol. 27 (no. 8); 750-7

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.
Aim	To investigate patients' and carers' experiences of Early Supported Discharge services and inform future Early Supported Discharge service development and provision.
Population	Stroke patients N=27 People with a confirmed diagnosis of stroke who were assessed as requiring rehabilitation. Fulfilling the inclusion criteria: Barthel Index at least 14/20; within 14 days of stroke onset; transfer independently or with assistance of one; identified rehabilitation goals; their hospital consultant agreed they were medically stable. Both people who received and did not receive early supported discharge care (for example: living outside of the geographical boundaries) were recruited.

	Participant characteristics: 69.85 (13.42) years. Carers N=15 Carers of stroke survivors who were referred to an Early Supported Discharge service Participant characteristics: Mean age (SD): 72.79 (14.10) years. Male:Female = 2:13.
Setting	Two stroke units in the Nottinghamshire region in the United Kingdom.
Study design	Interviews. The duration of interviews ranged from 30 to 45 minutes. The interviewed were guided by a semi-structured interview framework, giving respondents a high degree of control over the conversation. Although each interview covered the same broad topics, new topics introduced by the interviewee were discussed in detail as they arose. All interviews were conducted in the patients' usual place of residence within one and six months of hospital discharge allowing participants to reliably comment on the services they were or had received. Interviews continued until data saturation was reached within each group. Interviews were audio recorded and transcribed verbatim with all personal identifiers removed. A qualitative data analysis software package (QSR NVivo 9) was used to organize the data efficiently and systematically.
Methods and analysis	Data from each group of interviews were analysed separately. A thematic analysis approach was followed to identify and report patterns (themes) within the data. Identifications of themes proceeded inductively, whereby datasets were read and codes were assigned to text segments that conveyed interesting information in relation to the research question. Through a qualitative constant comparison process, pieces of data (i.e. interviews, statements or a theme) were continuously compared in order to identify similarities and differences. Relevant codes were grouped into subthemes and were them summarized to form main themes. The themes that emerged from each group of interviews were compared and contrasted, resulting in the identification of themes that were common across both groups and themes that were only informed by the responses of participants receiving Early Supported Discharge services. These two groups of themes are reported separately. Cases disconfirming the core themes were examined and reported. A second researcher reviewed the interview

	transcripts and checked the relevance of each theme. Differences in research perspective were discussed and agreement was reached.
Findings	**Early Supported Discharge specific themes** *Satisfaction with rehabilitation exercises* Almost all interviewees reported feeling satisfied with the various exercises they had been taught and left to complete, enabling optimal functional recovery. People frequently commented on the benefits of receiving therapeutic sessions both within and outside the home environment. *Home as a better arena for rehabilitation* There was a consensus of preference among participants for returning to their home environment as soon as possible. Commonly, the home environment was described as a more private and individualised arena for rehabilitation. Rehabilitation in the home environment was seen to be more cost-effective and less demanding. Furthermore, the home environment was perceived to be more focused toward rehabilitation outcomes. *Time not being a carer* Respite time for the carer formed a core theme in the responses of carers who reported that the therapeutic sessions between patient and the Early Supported Discharge team enabled them to engage in their own activities. On the contrary, two carers described feeling housebound as the team were 'not with the patient long enough' to enable sufficient respite time for the carer.

Speed of response

The majority of patients reported feeling positively surprised with the seamless transition between hospital and home setting, with the first Early Supported Discharge home visit being made within 24 hours of hospital discharge. However, one reported having to wait several days for the Early Supported Discharge team to make their initial visit.

Intensity of therapy

The intensity of rehabilitation provided, of up to four visits per day, seven days per week for a duration of six weeks was received very positively by virtually every respondent. Participants talked about how the consistency and regularity of visits provided a sense of security during such a life-changing transitional period.

Satisfaction with provision and delivery of equipment

For patient safety purposes, the Early Supported Discharge teams complete an access visit to ensure all the necessary equipment is in place for the patient prior to hospital discharge. There was a general consensus among participants that the equipment provided was useful and delivered in a timely manner. Nethertheless, one person found the equipment unsuitable and one was disappointed at being promised aids that never materialized.

Disjointed transition between Early Supported Discharge and future services

Following Early Supported Discharge, if needed, people were referred onto appropriate community services for on-going support and rehabilitation. However, some felt that the six-week cut off was 'abrupt' and not 'continuous enough'. Furthermore, some transferred to further services did not feel that this transition was always well managed.

Common themes in both cohorts of interviews

Limited support in dealing with carer strain

Carers are left feeling exhausted and physically strained. In addition, carers reported having to undertake tasks previously the responsibility of a partner. Most carers described suffering a reduction in time for leisure and social activities that, in turn, limited their opportunities for much needed social support. Not only had they had to respond to new roles and responsibilities in caring for the stroke survivor, but also to adapt to a new relationship with their spouse. Many respondents indicated that they felt thrown into the caring role without receiving enough support from the community stroke teams. They stressed the need for services to consider and address carer issues.

Lack of education and training of carers

Several carers reported being poorly informed regarding the extent of support available after discharge. The training of carers in how best to physically support the patient was described as inadequate. carers also highlighted their difficulty in coping with the stroke patients' emotional and psychological needs.

Inadequate provision and delivery of information

In several interviews, both patients and carers expressed their concerns about their limited understanding of stroke and its causes, secondary preventative measures and lifestyle changes. Both patients and carers spoke of the difficulties they had encountered in accessing information concerning welfare benefits, carer allowance, statutory and informal support. Many participants felt that the information was delivered in an inappropriate format. Participants expressed their disappointment about having to wait lengthy periods before receiving some information. Many respondants described the information provided as failing to address their own needs and issues of concern.

Limitations and applicability of evidence	Limitations: None discussed. In looking at the study, you could argue that bias may be present in people who did not receive an early supported discharge service package in reporting general issues with discharge if unsatisfied with their previous lack of care received. Applicability of evidence: Applicable as from a United Kingdom population. Not completely relevant to a question on intensity, but very relevant to the topic of early supported discharge.

Study arms

Stroke patients (N = 27)
People with a confirmed diagnosis of stroke who were assessed as requiring rehabilitation

Carers (N = 15)
Carers of stroke survivors who were referred to an Early Supported Discharge service

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Connell, 2018

Bibliographic Reference	Connell, Louise A.; Klassen, Tara K.; Janssen, Jessie; Thetford, Clare; Eng, Janice J.; Delivering Intensive Rehabilitation in Stroke: Factors Influencing Implementation; Physical Therapy; 2018; vol. 98 (no. 4); 243-250

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.
Aim	To investigate factors influencing implementation of higher-intensity activity in stroke rehabilitation settings
Population	Healthcare professionals N=15 Physical therapists and rehabilitation assistants who were currently using, or had previous experience of delivering, the DOSE intervention as part of a stroke rehabilitation clinical trial. The majority of participants were physical therapists (n=12) with 3 rehabilitation assistants. Participant characteristics: Mean age (SD): 37 (9.2) years; time since qualified (SD): 12.1 (10.0) years; time specialized in neurology (SD): 9.1 (7.9) years. Of the physical therapists: educated to bachelor's degree level: 5, master's degree level: 6, doctoral degree level: 1.

Setting	Practitioners delivering more intense interventions as a part of a randomised controlled trials conducted in Canadian rehabilitation units across 4 provinces.
Study design	Semi-structured interviews using an interview guide developed from the Normalization Process Theory and the Consolidation Framework for Implementation Research. The interviews were conducted by the lead author via telephone and Skype. Participants were not known to the interviewer. Participants were informed of the reason for the study, and were asked to consider their thoughts in relation not only to the DOSE intervention but also to high-intensity interventions in general and how/if they should be implemented in clinical practice (outside of a research trial). Participants were aware that the interviewer was not part of the DOSE research team and wanted an honest perspective to learn lessons for implementation, and were aware that criticism was welcomed. All participants provided written informed consent and received $100 (CDN) honorarium to compensate them for their time. The interview guide was reviewed and piloted with 2 researchers and 2 physical therapists. Interviews were digitally recorded and transcribed verbatim to enable in-depth analysis.
Methods and analysis	Interview transcripts were imported into NVivo 11 for analysis. The CFIR was used to code the data, with additional free codes developed where the coding frame was considered to have gaps. The transcripts were coded separately by the first, third and fourth authors. In order to establish a shared understanding and interpretation of the coding framework, all 3 researchers coded the same single transcript. The coded transcript was compared and any variance in interpretation of data and application of codes was discussed to arrive at a mutual decision. Three further transcripts were analysed separately and reviewed as a team to check for consistent interpretation and application of the coding framework, before remaining transcripts were coded separately.
Findings	**Characteristics of the individual** *Knowledge and beliefs* Generally, therapists were positive toward the concept of intensity, but were not always sure how to actually deliver it. The DOSE intervention fit better with some people's belief system than others due to conflict with quality of movement versus quantity of movement. Some people's beliefs changed once they had trialled the intervention.

	Self-efficacy Therapists gained confidence to "push people harder" due to: the graded exercise test making them confident patients had the "all clear", seeing patients able to work harder, using heart rate monitors and step counters as objective measures. *Individual stage of change* Most individuals were in the preparation or contemplation stage of change. Some recognized their practice had already changed. Others still felt they would "step back" to their everyday clinical practice. *Other personal attributes* Most therapists had some previous exposure to research and were keen to be involved. Two participants felt obliged to take part in the trial. **Intervention characteristics** *Evidence strength and quality* Practical experience of using the intervention tended to outweigh publications. Some mention of importance of having underpinning research.

Relative advantage

Graded exercise test gave therapists the advantage of knowing they could push the patient harder.

Adaptability

Research protocol needs to be adaptable for clinical reality (eg, more focus on upper limb/education for some patients). Therapists thought that "pre-gait" activities were essential, though recognized doing this first may reduce intensity.

Complexity

Graded exercise test and the monitoring of heart rates enabled therapists to push patients harder than they normally would have (more radical). The need for a graded exercise test and the equipment make the intervention more difficult to implement. The frequency and duration of sessions was considered difficult to implement outside of the study (in terms of staffing).

Design quality and packaging

Therapists liked the structure and detail of the manual and paperwork, particularly tips and ideas. The structured format helped support different therapists treating the same patients.

Inner setting

	Structural characteristics Concerns regarding staffing to enable the duration of therapy outside of the study, shift required in how therapists prioritize treatment and buy-in from all therapists and managers when scheduling to allow for longer sessions. *Networks and communication* Communication important to ensure treatment schedules work to allow for longer sessions. *Culture* Recognition that these therapists worked in research intensive departments. *Readiness to implementation* Leadership engagement recognized as important to support the resources required. *Available resources* Need for graded exercise test, and ideally equipment (heart rate monitors, step counters, treadmills, harnesses) - this is in terms of staffing and equipment.

	Outer setting *Patient needs and resources* Recognition that this type of intervention will not be suitable for all (especially elderly with co-morbidities). Patients generally liked the high intensity and felt they accomplished something. The therapists were surprised how hard patients worked and tolerated intensive regime. *External policies and guidelines* The Canadian guidelines for stroke state a graded exercise test should be undertaken which poses a challenge for implementation.
Limitations and applicability of evidence	Limitations: The data collected relied on the healthcare professionals' ability to recall events from a few weeks to 2 years prior to the interviews. Participants were invited volunteers, thus introducing a self-selection bias. As the data are self-reported in nature, there is a risk of social desirability bias. This was an exploratory study and so causality cannot be assumed. This trial investigates intensity as time, but other factors may be relevant including the partnership between professional and patient, repetitive task training and quantity versus quality. Applicability of evidence: Mostly applicable. The Canadian healthcare system is not too different from a United Kingdom perspective, but will have some differences. This is discussing a specific intervention so may not be appropriate to generalise to all of intensive rehabilitation.

Study arms

Healthcare professionals (N = 15)
Physical therapists and rehabilitation assistants who were currently using, or had previous experience of delivering, the DOSE intervention as part of a stroke rehabilitation clinical trial.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Connell, 2014

Bibliographic Reference	Connell, Louise A.; McMahon, Naoimh E.; Harris, Jocelyn E.; Watkins, Caroline L.; Eng, Janice J.; A formative evaluation of the implementation of an upper limb stroke rehabilitation intervention in clinical practice: a qualitative interview study; Implementation Science; 2014; vol. 9 (no. 1); 90-90

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	Harris JE, Eng JJ, Miller WC, Dawson AS. A self-administered Graded Repetitive Arm Supplementary Program (GRASP) improves arm function during inpatient stroke rehabilitation: a multi-site randomized controlled trial. Stroke. 2009 Jun 1;40(6):2123-8.
Aim	To conduct a formative evaluation of the implementation of GRASP to inform the development and implementation of a similar intervention in the United Kingdom
Population	Healthcare professionals N=20 Physical therapists, occupational therapists and rehabilitation assistants who were currently using GRASP, or had previous experience of using GRASP, or were involved in the implementation of GRASP at their work setting. People were identified through existing contacts with the research team, through the public registries for BC Occupational Therapists and Physical Therapists and through a database of therapists that had agreed to be contacted about future research relating to the program through the GRASP website. These potential participants were sent an email by the fifth author outlining the details of the study and inviting them to take part in an interview of maximum one hour in length. A snowball sampling technique was used to identify colleagues from their work place and other sites who may be appropriate. Participant characteristics: Role: Physiotherapist = 5, Occupational therapist = 13, Rehabilitation assistant = 2. Years of experience (range): 3-37 years. Level of education: Cert (rehabilitation assistants). Otherwise BSc to MSc. Experience of GRASP from a range of inpatient and outpatient settings.
Setting	The interviews took place at the worksite of participants at a time deemed suitable by them. In instances where it was not possible to conduct the interviews face-to-face, the interviews were carried out over the telephone. Conducted in Canada from people across 8 sites (two sites were in the Greater Vancouver area).
Study design	A cross-sectional study design was used with data collected via semi-structured interviews. The approach used in this study was directed content analysis. Three frameworks from implementation science were used for this: normalisation process theory, conceptual framework for implementation fidelity and consolidated framework for implementation research. The data collection tool used in this study was an interview guide. One researcher was used to devise questions and prompts about the processes of implementing and embedding GRASP in practice. The interview guide was reviewed and piloted with researchers with previous experience of using implementation framework for semi-structured interviews, and with

	therapists. The interviews lasted a maximum of one hour. They were audio-recorded and field notes made. All participants provided written informed consent and received a $25 Canadian honorarium to compensate them for their time. Interviews were conducted until no new implementation issues were being reported and data saturation was deemed to have been reached.
Methods and analysis	Interview transcripts were transcribed verbatim and imported into NVivo 10 for analysis. Transcripts were first read for understanding to describe each case and to establish an initial coding frame. the coding frame was also informed by prior research that explored upper limb exercise prescription by UK therapists, and uptake of GRASP in the UK, as it was hypothesised that similar experiences would arise for both population groups. Transcripts were then re-read by the first and second authors and separately coded. The coding frame evolved as analysis progressed. This was facilitated by regular team meetings to discuss and agree on emerging themes and resolve discrepancies in coding. One author constructs were used to code text relating to the processes of implementing GRASP in clinical practice. The CFIF was used to code text relating to how GRASP is used in practice. These codes were then used to evaluate adherence to the intervention components identified a priori from the GRASP Guideline Manual. The CFIR was used to code emerging factors that influenced both use and implementation of GRASP. Therapists in the research team provided feedback throughout the process, which helped to ensure that findings were credible.
Findings	**How the GRASP was used in practice** *Coverage (who should receive the intervention)* GRASP was reported to be used not only in stroke rehabilitation units but it is also used in acute care, outpatient and community settings, and with other population groups with neurological conditions. One therapist used the Fugl-Myer to select the appropriate GRASP level for each patient; the remainder selected the appropriate level based on observation of active movement and tone. *Content (the content of the intervention)*

One therapist reported always providing the full GRASP manual to patients, while the majority selected the most appropriate exercises from the manuals and printed them off individually. Two sites provide full kits of equipment, one provided half sets of equipment that are more difficult to source, one provided equipment piece by piece as needed, to use gym equipment that is cleaned and reused, two sell equipment to patients. Six therapists mentioned using/trying to use a written checklist or log sheet to monitor exercise completed. As therapists do not always use the full manual, progression was discussed in terms of adding in new sheets of exercises or increasing repetitions as opposed to the more structured progression in the manuals. Nine therapists reported that stroke survivors, where able, would be advised to complete exercises outside of therapy time. Barriers to prescribing exercises to be completed outside of therapy time included therapists' beliefs about patients' ability to correctly complete exercises, patient safety awareness, cognitive impairment and lack of family support for self-directed exercise. As a result exercises were most often completed with the supervision/assistance of a rehabilitation assistant. All therapists made references to concerns about the quality of the exercises that stroke survivors would do and the amount of compensation. Exercises were modified or omitted if it was felt it wasn't being done correctly. All therapists reported that family played an important role in GRASP. The readiness and willingness of family members, as determined by the therapists, would influence the extent to which they would be involved.

Dose (frequency and duration)

Patients were advised by therapists to carry out the exercises as much as they could tolerate on a daily basis, rather than specifying 60 minutes daily. Therapists discussed different approaches to getting patients to complete the desired amount of practice, such as splitting GRASP up throughout the day and providing extra sessions with the rehabilitation assistant.

Factors influencing the implementation and use of GRASP

Inner and outer setting

Access to knowledge and information

Ten therapists reported that the GRASP website and free online availability of the treatment protocol enabled them to find out about the intervention and also facilitated its continued use.

Cosmopolitanism

Therapists reported finding out about GRASP through existing networks with the research team at GF Strong (where GRASP was developed) and national meetings with 11 therapists mentioned Janice Eng by name.

Leadership engagement

The implementation of GRASP was facilitated by active engagement of practice leaders and clinical supervisors as they were responsible both for identifying the programme and introducing it at the work site by acquiring resources to support implementation (e.g. funding for equipment).

Intervention characteristics

Design, quality and packaging

GRASP was perceived to be well designed and presented. The large text and clear pictures were seen to be highly beneficial, particularly for a population often suffering from some degree of cognitive impairment. Therapists reported that the manual could be improved by shortening it and reducing repetition of exercises within and between levels of manuals.

Evidence strength and quality

All therapists agreed that GRASP was underpinned by best evidence for motor recovery after stroke and reported sharing this information with the patients to whom they prescribed GRASP.

Relative advantage

The primary advantage of GRASP was that it provided a more time efficient way of providing exercises to patients - something that therapists regularly do in practice anyway.

Complexity

Organising the GRASP equipment was identified as the most complex component of the intervention and this influenced the way in which the intervention was used (i.e. substituting items of equipment or omitting some exercises altogether).

Characteristics of individuals

Knowledge and beliefs

Therapists' beliefs about the quality of exercises that patients would be able to complete outside of therapy time influenced the way in which GRASP was used in practice (e.g. completing GRASP exercises during therapy time).

Limitations and applicability of evidence	Limitations: The self-report data collected in this study relied on therapists' ability to recall events from a few months to a couple of years prior to the interviews. As participants were volunteers, a self-selection bias exists where perhaps therapists with stronger opinions on the programme and/or its implementation are over represented thus limiting the generalisability of the study findings. The self-report nature of the data introduces the risk of social desirability bias. Applicability of evidence: Broadly applicable. Canadian healthcare system is mostly relatable to a United Kingdom setting. Discusses a specific technique at delivering intense rehabilitation so may not be relatable to all types of intense intervention.

Study arms

Healthcare professionals (N = 20)
Physical therapists, occupational therapists and rehabilitation assistants who were currently using GRASP, or had previous experience of using GRASP, or were involved in the implementation of GRASP at their work setting.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Connell, 2016

Bibliographic Reference	Connell, Louise A.; McMahon, Naoimh E.; Tyson, Sarah F.; Watkins, Caroline L.; Eng, Janice J.; Mechanisms of action of an implementation intervention in stroke rehabilitation: a qualitative interview study; BMC Health Services Research; 2016; vol. 16; 534-534

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
Aim	To use the Behaviour Change Wheel (BCW) to identify mechanisms of action and provide a rich explanation as to how our implementation intervention supported change at a site level
Population	Healthcare professionals N=23 Physiotherapists, occupational therapists, therapy managers and therapy assistants at participating sites involved in the embedding of PRACTISE. They were obtained from a purposive sample. Participant characteristics: Physiotherapists: 8. Occupational therapists: 11. Therapy assistants: 4. Qualified for 5 years or less: 6. More than five years of experience: 10. Junior (NHS band 5) = 2. Senior (NHS band 6-7) = 14. Team leads/therapy manager = 3. Only 1 staff member was male.

Setting	Six month phased approach to implementation in three stroke rehabilitation units in the North West of England (the stroke unit where the intervention was developed and two additional stroke units). Implementation was guided by the target behaviours (i.e. starting with the screening of patients before progressing to provision of arm exercises) and commenced at Sites A and B in October 2014. Site C acted as the development site for the intervention from December 2013 to June 2014. The PRACTISE (Promoting Recovery of the Arm: Clinical Tools for Intensive Stroke Exercise) intervention consisted of face-to-face meetings between the research team and therapy teams, materials to aid implementation using established behaviour change techniques. The exercise intervention was the GRASP intervention (see Connell 2014).
Study design	Qualitative interview study. Semi-structured face-to-face interviews were conducted to explore therapists' perceptions of how the intervention produced, or failed to produce, change were conducted by two staff members on site in quiet spaces and at convenient times for the interviewees. Where possible, interviews were conducted in private offices, but sometimes they were conducted in quiet corners of public spaces, e.g. the hospital canteen due to space limitations. Normalisation Process Theory was used to develop an interview guide. NPT is a sociological toolkit to understand the work that is done to implement and embed complex interventions in healthcare settings. Particular emphasis was placed on probing questions that encouraged participants to reflect on what supported change throughout the stages of implementation. Interviews were audio-recorded and all participants provided written informed consent prior to the interview. Field notes were made after each site visit to document the following: observations, the content of monthly meetings; ad hoc discussions with therapists; additional contacts (e.g. email) between meetings and reasons for these; and informal discussions on the progress of the study by therapists and managers. This was summarised at the end of the data collection period.
Methods and analysis	Audio recordings were transcribed and imported into NVivo 10 for content analysis. Interview transcripts were coded by two investigators using predetermined codes based on the Theoretical Domains Framework. The TDF is an extension of the Capability, Opportunity and Motivation model at the hub of BCW. Codes were compared between researchers and non-fitting items discussed. An agreement was reached on where the mechanisms fit within the TDF, with any further points of contention discussed with all the authors and agreement sought. Emergent mechanisms were discussed with study participants to ensure that the data had been accurately interpreted and to provide opportunity for clarification of preliminary findings. The final coding process involved free coding of text where participants provided rich and insightful reflections as to how and why the intervention produced change.

	Following the final coding process, the research team met to synthesise the results by listing the findings from the perceived mechanisms of action. Discrepancies between the determinants of behaviour as assigned a priori in the development stage using the COM-B model, and possible mechanisms of action as identified by the TDF were discussed and agreement made about how the intervention is understood to work.
Findings	**Mechanism of action** Five mechanisms were to used to explain how, or why, PRACTISE produced the observed changes. *Social/professional role and identity* Personal qualities of an individual in a social or work setting. They viewed the research team as an external influence for whom they wanted to ensure all required work was completed. This links to the constructs of professional credibility and identity. Secondly, they valued their relationship with the university, which gave an impetus to ensure they delivered the required work. The social identity, and how therapists related to the research team influenced their behaviour. *Intentions* Intentions relate to a conscious decision to perform a behaviour on a resolve to act in a certain way. Participants accredited their intent to engage with the study to its design. At the outset, they stressed that the purpose of the study was to test the feasibility of implementing PRACTISE at their work setting and that all feedback or suggested revisions would be welcome. This meant therapists did not feel threatened and were willing to move from contemplation and preparation to action. This theme emerged particularly strongly at Site B where the therapy team were implementing PRACTISE during a service re-organisation, and hence had difficulties performing the target behaviours. When therapy teams were reassured that capturing all of these experiences and challenges was worthwhile for the research, they felt under less pressure to perform all target behaviours consistently and as a consequence persevered with the study processes. Emphasising the PRACTISE could, and should, fit with 'real life working' seemed to resonate with participants and was very much in contrast to their past research experiences.

At the development site, upper limb therapy input was used for the team's internal annual audit, which acted as a driving force to sustain implementation even after the research team's involvement had come to an end.

Reinforcement

The active involvement of researchers at the regular team meetings provided reinforcement to perform the target behaviours, and meant that there was recognition amongst peers if behaviour were performed, and conversely negative consequences of reporting that behaviours weren't being undertaken. The challenge of maintaining momentum with implementation was highlighted.

Behavioural regulation

Anything aimed at changing objectively measured actions. The intervention relates to constructs of self-monitoring and action planning. The purpose of the audit tool was specifically to facilitate self-monitoring performance of target behaviours. Participants confirmed that the audit tool in weekly meetings acted as a reminder to keep up with the PRACTISE activities. However, they viewed the tool more as research data than as a method of monitoring overall service performance. Site C was an exception, as they were using the data collected to conduct an internal audit. Therapists also discussed how the team meetings acted as a prompt to plan who would be responsible for each of the target behaviours for each patient.

Beliefs about consequences

Acceptance of truth, reality and validity about outcomes of a behaviour in a given situation. Beliefs centred around the consequences for the therapy teams, rather than the consequences for patients. At the outset, therapists were understandably concerned about the feasibility of implementing something new with already constrained resources.

	However, as the study progressed, therapists' attitudes towards the value of the intervention seemed to change whereby it was no longer seen as an added burden but an integral part of their therapy that brought reward.
Limitations and applicability of evidence	Limitations: The study was designed to put information into an established framework, which may introduce bias to make opinions fit an existing model. This was minimised through discussions with the research team and participants to check interpretation, but did affect reliability. Participants may have been inclined to provide favourable responses to the interviewers' questions (social desirability bias). Applicability of evidence: Applicable to a United Kingdom setting. The intervention may not be broadly applicable to more intense rehabilitation (discussed one type of intervention that may be used to provide more intensive rehabilitation).

Study arms

Healthcare professionals (N = 23)
Physiotherapists, occupational therapists, therapy managers and therapy assistants at participating sites involved in the embedding of PRACTISE.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Demain, 2013

Bibliographic Reference	Demain, S.; Burridge, J.; Ellis-Hill, C.; Hughes, A. M.; Yardley, L.; Tedesco-Triccas, L.; Swain, I.; Assistive technologies after stroke: self-management or fending for yourself? A focus group study; BMC Health Services Research; 2013; vol. 13; 334

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.
Aim	To identify current assistive technology knowledge and service provision and the barriers and opportunities for evidence based assistive technologies to be used in stroke upper limb rehabilitation practice, as perceived by stroke survivors, family caregivers and healthcare professionals
Population	Stroke patients N=8 People who were assistive technology naïve and experienced. People after a stroke requiring upper limb rehabilitation. Participant characteristics: Age (range): 46-78 years. 1 female:7 male. 2 alone, 6 with partner/spouse. Time since stroke (range): 1-12 years. Employment status: 1 working. Experience of using assistive technology: 4 none, 4 prior experience (1 robot, 2 electrical stimulation, 1 implanted electrical stimulation, 1 dynamic splints).

	Family caregivers N=7 Family caregivers supporting people after a stroke. Including people who were assistive technology naïve and experienced. Participant characteristics: Age (range): 44-82 years. 6 female:1 male. 1 alone, 6 with partner/spouse. Time since stroke (range): 2-13 years. Employment status: 1 working. Experience of using assistive technology: 4 none, 3 prior experience (1 robot, 1 electrical stimulation, 1 implanted electrical stimulation, 1 dynamic splints). Healthcare professionals N=6 Healthcare professionals including physiotherapists, occupational therapists and a clinical registrar. Participant characteristics: 5 female:1 male. Employment status: Qualified 6-24 years. Experience using assistive technology: 1 none, 5 prior experience (3 electrical stimulation, 4 dynamic splints, 4 virtual reality/computer games). Professional status: 2 physiotherapist (NHS), 1 physiotherapist (private practice), 1 occupational therapist (NHS), 1 occupational therapist (social services), 1 clinical registrar.
Setting	Focus groups at an Assistive Technology interactive exhibition held by 12 different companies displaying 2 different upper limb assistive technologies for stroke rehabilitation held over 3 days at the University of Southampton, United Kingdom. A range of stakeholders were invited including: people with stroke, their friends, family members who provided care or support to a person with stroke, commissioners, budget holders, clinicians and representatives from the local voluntary sector.

Study design	Participants were invited to focus groups. Four groups were used: 1) people who had not used assistive technology (4 patients and 1 family caregiver), 2) people who had used at least one assistive technology (4 patients, 2 family caregivers), 3) family caregivers (5, 1 of whom also attended focus group 1); 4) healthcare professionals (6). Inclusion criteria were: stroke survivors, having a previous stroke at any time; family care givers, who defined themselves as supporting a family member who had a stroke; health professionals - engaged in stroke rehabilitation in the last 2 years. Aphasia and cognitive difficulties were not exclusion criteria (but it is implied that people did not have either of these). Each focus group was held at the University of Southampton and facilitated by a researcher. An observer noted non-verbal aspects of the group. At the beginning of each focus group the participants were reminded that the researchers were interested in hearing their views on the use of technologies for helping people recover use of their arm and hand after stroke and reminded of the technology which was on show at the exhibition via individual information sheets and posters around the room. Categories of assistive technologies discussed were virtual reality (including commercially available gaming technologies such as the Nintendo Wii); dynamic splints; biofeedback; robots; constraint induced movement therapy and electrical stimulation. Four separate topic guides were used, with the content being similar for each group. Audio-recordings were gathered.
Methods and analysis	Audio-recordings were transcribed verbatim; observed and noted non-verbal information was incorporated into the transcripts. Pseudonyms were allocated to maintain confidentiality. Data were managed using NVivo 8 software and analysed thematically. Transcripts were read, re-read and coded inductively by two researchers, cognisant of the research questions. They discussed and grouped codes with related meaning to generate emergent themes for each focus group: for instance 'funding application refused' was grouped with 'purchasing private physiotherapy' to form the family focus group theme of 'financial impact on families'. Themes generated for each focus group were then compared and contrasted across all focus groups to highlight similarities and differences in the data and generate the final overarching thematic structure presented in the findings. Codes and developing themes were discussed with the wider research team throughout this process to highlight alternative interpretations and agree analytical decisions.
Findings	**Assistive technologies as a tool for supporting self-management in stroke rehabilitation** The potential of assistive technologies to facilitate self-management was a core concept. A focus on mobility and limited attention to arm rehabilitation was emphasized. They assumed that once they got home arm and hand rehabilitation would be prioritised, but this was not the case. They reported a discontinuity between therapy in hospital and at home, with long

waits before home-based therapy commenced and a reduction in intensity when it did. Many had a lay understanding of the principles of neuroplasticity and that intensity and repetition were necessary to optimise functional recovery.

Assistive technologies were suggested as a solution for this disconnect. People with stroke and their families suggested that they could be taught how to apply and use assistive technologies whilst in hospital, be provided with an assistive technology to take home and then use this to deliver intense, repetitive therapy both before and after their home therapy commenced. The health professionals were more ambivalent about using assistive technologies to facilitate the transition home. The hospital-based therapists were concerned about how they would find the time to prescribe and teach people how to use assistive technology, given the focus on facilitating discharge. But they recognised the potential for assistive technologies to provide intensive therapy and a means of self-management. All patient participants were keen to self-manage. They were all actively engaged in looking for solutions to promote arm recovery and were prepared to spend time and, if necessary, money on potential solutions. The opportunity for self-management was influenced by a) device design, b) access to information and access to devices.

Device design for self-management

Assistive technology needed to be simple to apply, easy to use, motivating and to provide feedback on performance. All participants recognised the motivational aspect of assistive technologies. They were seen as an improvement on routine therapy the fact that they were 'hi-tech' and designed specifically for rehabilitation made them more credible and enjoyable than traditional therapy exercises, which were often deemed to be boring and difficult to notice improvement. The preference for technological solutions seemed to be particularly true of the younger, male patients in our study; a view reiterated by the therapists, who also suggested that patient acceptance of, and demand for, technologies would increase as the technical competency of the population increased.

The time taken to prepare, set up and maintain assistive technology devices was seen as a key issue of all stakeholders. For therapists, the devices were viewed as a tool for improving productivity and effectiveness by enabling more patient practice hours per therapist. Concerns were expressed about devices which needed complex adjustment between patients (robots and dynamic splints), which might be difficult to move to the patient (robots), which were complex to programme

(electrical stimulation, robots), which were time consuming to clean (most products) and difficult to store (robots in particular). For patients and families, the devices needed to be easy to get on and off a weak and/or contracted hand/arm (problems identified with splints and some robots) and to be intuitive in terms of correctly positioning the device (problems identified with some electrical stimulation devices and robots). Good device design was critical.

Access to information

Many of the patients had not known anything about assistive technologies prior to attending the exhibition. Several expressed amazement at what they had seen and tried out and wished there were more similar opportunities available. Others had used assistive technologies for their leg, but not been offered anything for their arm, whilst others had used assistive technologies for their arm whilst in hospital but had to return to devices on leaving hospital. Several patient and family caregivers had sought out information on assistive technologies. This generally occurred after the people were discharged from therapy but were still looking for a solution to their persistent arm and hand disability. They gathered information from a variety of sources; other people affected by stroke who used assistive technologies, information in the national press, the internet and from sales representatives. Patient and family caregivers worried about the quality of the information available from these sources and the relevance of the information to their own situation. They would have liked to be able to seek advice from a therapist they knew and trusted.

Participants in each group suggested they had not been given more information on technologies by therapists because: a) therapists were overworked, b) lacked knowledge and training about what was available, c) were reluctant to give information about devices that they could not provide within the state funded service. One therapists confirmed these opinions when they expressed their concerns over the time pressures assistive technology prescription could generate for their service. The patient and family caregiver participants felt strongly that health professionals should give them access to information so that they could choose whether or not to purchase equipment for themselves. As this was an issue over which patients and family caregivers had expressed strong feelings we sought out health professionals' views about the level of information provided. Many dilemmas were apparent including a) the lack of strong research evidence for upper limb assistive technology, b) concerns over inequity in assistive technology provision, c) tensions about highlighting the existence of a device which may help but which is not available from state-funded services. An interesting contrast between the views of those working in the state-funded system and the therapist working in private practice was noted. Both agreed the evidence base underpinning the use of assistive technologies in stroke arm rehabilitation was weak. Those working in

	the state system said this made them reluctant to talk to patients in case it influenced them or their families to purchase something that may not work. In comparison, the private practice therapist suggested that if a patient asked about a device they had seen on the internet they would help them establish what the evidence base was and, if they wanted, arrange a meeting with the company representative. They indicated that many patients and families were accessing this information on the Internet anyway and that they needed therapists' support in making an informed decision. However, both indicated that, whilst they would respond to the patient's request for information they would not proactively inform them about devices, for fear of creating the impression of endorsing a product for which there was insufficient evidence. Health professionals were not only concerned about a lack of evidence for benefit, they also worried about the potential risk of harm, especially if they were to give advice about a device but could not provide adequate follow-up to ensure its safe use in the community. This extended beyond the risks to the patients and included risks of litigation to themselves and their organisation. In contrast, some of the patients and family caregivers were more willing to accept risks. In the absence of health service provision, one couple had purchased their own assistive technology device (electrical stimulation) online. To do this, however, the patient's wife had to pretend that she was a health professional. The sentiments expressed indicate that they thought it safe for them to use because they had already been shown how to use it, could follow the instruction booklet and the stroke survivor could feel if they were getting the right dose. This suggests that the family member and stroke survivor considered themselves to have sufficient expertise to use the electrical stimulation. A similar view of expertise was also expressed by one of the patients. They suggested that patients could train health professionals how to use certain assistive technologies because they may be more familiar with the devices than the therapists or nurses. The health professionals were also concerned about the risks of giving a false hope of recovery. In the absence of clear evidence, they worried that prescribing of giving information about such devices would generate unrealistic expectations which would be harmful for patients, and difficult for therapists to manage. The patients and family caregivers were aware of the health professionals' reluctance to raise hopes and of the arguments about lack of evidence. However, they were less interested in generic findings, arguing that every person with stroke is different and that evidence of benefit should be sought on a case-by-case basis.

	On patient and his wife, who reported gaining benefits from a trial of an upper-limb assistive technology, were frustrated that the commissioners based their funding decisions on generic evidence rather than on what they believed had already been proven to 'work' for them. **Accessing equipment** A recurrent theme was the lack of funding for upper limb assistive technologies. Health professionals' perceived this as the biggest barrier to assistive technology provision. Health professionals were keen to explore the effectiveness of assistive technologies with individual patients. People with stroke and their family caregivers focussed more on lack of funding rather than lack of evidence as the reason why assistive technologies were not available. Two people had used devices in a state funded capacity, as a temporary loan from the service with its use ending on hospital discharge which they did not believe was based on clinical rationale. They believed that if the device was demonstrated to 'work for them' that was sufficient evidence that it should be provided for them, regardless of transitions between hospitals or services. Many of the patients and family caregivers discussed the cost as a barrier to them self-funding. Some indicated they would be prepared to self-fund if they were able to test them first for personal benefit. This, they indicated, needed to be more than a single trial with a company representative; they wanted to use the device for a period of time to see if they could detect benefits. As far as patients and families were concerned generic evidence was neither necessary nor sufficient; they wanted to know it worked for them in their daily lives.
Limitations and applicability of evidence	Limitations: None noted by the study. From the perspective of the reviewer, this study took place with participants at an assistive technology demonstration and so may be more inclined to be positive to assistive technologies. Applicability of evidence: Applicable. United Kingdom setting with a wide perspective. A limited number of participants representing each groups, but still mostly applicable.

Study arms

Stroke patients (N = 8)
People who were assistive technology naïve and experienced. People after a stroke requiring upper limb rehabilitation.

Family caregivers (N = 7)
Family caregivers supporting people after a stroke. Including people who were assistive technology naïve and experienced.

Healthcare professionals (N = 6)
Healthcare professionals including physiotherapists, occupational therapists and a clinical registrar.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

D'Souza, 2021

Bibliographic Reference	D'Souza, S.; Godecke, E.; Ciccone, N.; Hersh, D.; Janssen, H.; Armstrong, E.; Hospital staff, volunteers' and patients' perceptions of barriers and facilitators to communication following stroke in an acute and a rehabilitation private hospital ward: a qualitative description study; BMJ Open; 2021; vol. 11 (no. 5); e043897

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.
Aim	To explore barriers and facilitators to patient communication in an acute and rehabilitation ward setting from the perspectives of hospital staff, volunteers and patients following stroke.
Population	Healthcare professionals N=51 Purposeful sampling of acute and rehabilitation hospital staff was conducted to include at least one representative from each acute and rehabilitation staff group including medical, nursing, volunteers and allied health staff members who were over 18 years of age. A total of 51 staff and volunteers were recruited by contacting staff department managers who identified staff currently working or had previously worked with patients following stroke on the acute or rehabilitation wards. Participant characteristics: Staff role: Acute nurses = 2, clinical nurse manager = 1, medical consultants = 2, rehabilitation nurses = 8, dietician = 1, occupational therapy manager = 1, occupational therapists = 5, occupational therapy assistants = 3, physiotherapists = 8, physiotherapy assistants = 2, social workers = 5, speech pathology manager = 1, speech pathologists = 4, speech pathology assistant = 1, volunteer manager = 1, volunteers = 6. Stroke survivors N=7

	Inclusion criteria: People admitted to the acute or rehabilitation ward with an acute stroke; less than 21 days post-stroke during data collection; able to provide informed consent based on the judgement of the medical team responsible for the medical management of the patient; Glasgow Coma Scale >10; estimated total length of hospital stay greater than 14 days; adequate English proficiency to participate in interviews as determined by managing speech pathologists or medical team. Exclusion criteria: Uncorrected hearing or vision (for example hearing impairment without the use of hearing aids or vision impairments without the use of glasses); medically unstable; documented diagnosis of current untreated depression, documented diagnosis of dementia, previous aphasia or traumatic brain injury. The diagnosis of aphasia was confirmed for those who achieved a Western Aphasia Battery-Revised Aphasia Quotient Score <93.7. Participant characteristics: Mean age (SD): 83 (7) years. Female: 4. Premorbid mobility (needing aids) = 1. Premorbid living arrangement (alone) = 3. Time since stroke (SD): 14 (5) days. Stroke severity (NIHHSS, 0-42) (SD): 4 (3). Mobility status at data collection time: Independent with or without walking aids = 1, stand-by assistance = 3, 1-2 person assistance = 2, hoist/wheelchair = 1. Cognition (MoCA) median (range): 18 (9-22). Aphasia severity (for the 3 people with aphasia, WAB-R) = 77 (6.50). Average number of days on each ward: Acute = 4 (17%), rehabilitation = 19 (83%). Average number of days in single room per participant: 3.1 (96%).
Setting	Conducted on an acute and a rehabilitation ward at a private hospital in Perth, Western Australia. The acute ward was a 26-bed unit with patients following acute stroke as well as other medical conditions. The acute ward had four individual rooms and nine shared rooms, two rooms with four beds per room, and seven rooms with two beds per room. Patients ate meals in their rooms and had access to an outdoor balcony area. The rehabilitation ward was a 44-bed mixed rehabilitation unit for patients following stroke and other medical, orthopaedic and postsurgical conditions. There were 36 individual rooms and 4 shared rooms with two beds in each room. Patients had breakfast in their rooms but were encouraged to eat lunch and dinner in one of two communal dining areas.
Study design	The study was part of a larger study which aimed to develop and test a Communication Enhanced Environment model within an acute and a rehabilitation ward. This study contributed to the before phase of the larger study outline below: 1) before phase: observe and quantify levels of engagement in language activity in the acute and rehabilitation ward environment for patients following stroke, and explore hospital staff, volunteers', and patients' perceptions of barriers and

	facilitators to communication in hospital; 2) implementation phase: develop and implement the CEE model on the acute and rehabilitation wards; 3) after phase: assess the impact of the CEE model on patient engagement in language activity, and hospital staff, volunteers' and patients' perceptions of barriers to communication in hospital, and explore staff experiences of the implementation and use of the CEE model. The first author, a friend speech pathologist and PhD student with 4 years clinical experience working in the hospital setting and 5 years research experience, including conducting interviews and focus groups, completed all semistructured interviews and focus groups. Staff were informed that the researchers wanted to investigate their perceptions of the hospital ward environment with regard to communication opportunities to inform the development of the model. Patients were informed that the researchers wanted to explore how the hospital environment influenced patient activity. All interviews and focus groups were conducted using interview and focus group guides and were audio recorded. Field notes were completed by the first author during data collection. Seven staff focus groups were conducted with two to eight participants in each group. One-on-one interviews were conducted with two staff members. All staff focus groups and interviews were completed on the hospital site in various locations that were private and quiet. Six out of seven patient interviews were conducted in person during their inpatient admission in their hospital room, and one was completed over the phone (person without aphasia) 1 day after the discharge. All interviews were conducted within 15 days poststroke. Interviews and focus groups were 20-60 minutes long, often varying based on the number of participants. On person with aphasia had two family members present during the interview. During the interviews and focus groups, clarifying questions and paraphrasing participant comments were used to confirm and clarify their perspectives and insights.
Methods and analysis	Focus groups and interviews were transcribed verbatim. Responses to any leading questions were removed from the data set. The theoretical framework for this research was a qualitative description approach. This approach involves describing patient experiences, with minimal interpretation of the data to minimise potential bias of the researchers. Participant experiences were analysed using NVivo computer software to manage the data. Data were grouped into themes according to content. The first level of coding identified the broad content of the data then subcategories were identified. Single lines of data were not removed from their 'story' during data analysis to maintain the context and help ensure meaning was not lost or misinterpreted. Ongoing critical review of the categories was conducted and themes were reviewed by a second researcher. Staff were provided feedback on the findings.
Findings	**Barriers to communication**

Hospital-related factors (barriers to communication)

Private rooms reduce opportunities for social interaction

Staff and patients described the impact of single rooms which limited incidental socialisation with other patients and their visitors.

Mixed wards affect staff acquisition of specialist skills

Staff described their perception of the negative effect a mixed hospital ward had on the acquisition of stroke-specific specialist skills.

Hospital environment does not encourage socialising

Staff talked about the physical hospital ward environment affecting social interaction as it contributed to a sterile atmosphere rather than one that promoted social activity. Staff also talked about the consequence of background noise and environmental distractors in large shared rooms on the acute ward which reduced their ability to communicate with patients with communication impairments.

Hospital policies restrict the development of communication-promoting ideas and initiatives

Hospital policies were perceived by staff as a barrier to communication, negatively influencing their ability to develop ideas and initiatives to increase patients' opportunities for social interaction. This included policies regarding leaving patients unattended in dining areas without patient care assistants supervising them and requiring nurses to supervise patients if

	they are eating; and reported limitations around food-related activities as a result of food hygiene policies and occupational health and safety. *Power imbalance of staff and patients in hospital controls patients' ability to access communication opportunities* Staff and patients discussed the influence of the power imbalance for patients in hospital, and patient perceptions that they have to do what is expected in the hospital environment. This appeared to limit the patients' ability to freely engage and explore the environment resulting in patients retreating to their room and limiting their opportunities to engage in activities. *Task-specific communication reduces patients' communication opportunities* Staff talked about the nature of interactions with patients as often being driven by the patient's care, restricting opportunities for communication beyond this context. ***Staff-related factors (barriers to communication)*** *Staff perception of time pressures limiting opportunities to communication* Both patients and staff perceived staff time pressures as a barrier negatively affecting communication on the wards. This may be the reflection of actual time pressures, or staff perceptions of their available time. Some staff reported that they felt interactions with patients with communication impairments required extra time which has challenging in a time pressured hospital environment. Time pressures were also perceived to restrict staff ability to facilitate opportunities for patients to socialise with other patients. For example, nurses appeared to deprioritise transferring patients to the communal area for lunch in busier times.

Staff and patients' underutilisation of available resources

Staff described the lack of accessible resources as a factor negatively affecting staff-patient communication. They described the need for resources when communication with patients with aphasia and other communication impairments but felt unsure about what these were or how to access them. They also described a number of resources that they felt patients were not aware of an therefore did not use such as volunteer services that promote communication opportunities and facilitate patient access to outdoor areas.

Individual staff factors leading to restricted opportunities for communication

Staff described individual staff factors such as personality, values and attitudes influencing communication opportunities for incidental social interaction during routine tasks.

Staff perception their role does not include communication tasks

Some staff perceived communication as a task separate from the responsibility of their role therefore limiting their facilitation of communication opportunities for patients.

Lack of staff knowledge and skills resulting in unsuccessful communication interactions or avoiding communication interactions

Staff described a lack of knowledge and skills in communicating with patients with communication impairments. Some staff reported feeling anxious about encouraging patients to communicate as communication breakdowns may cause stress and anxiety for the patient, and the staff member. Staff reported a lack of confidence in their ability to repair communication

breakdowns which resulted in increased time pressures in their sessions, often leading them to avoid encouraging communication interactions within their treatment sessions.

Patient-related factors (barriers to communication)

Patients' functional and medical status limiting their ability to seek out and engage in activities

Staff and patients perceived patients' medical status as a barrier to communication by limiting their ability to engage with their environment including independently seeking out activities and being able to use communal areas.

Individual patient factors limiting opportunities for communication

Staff described individual patient factors such as personality, mood and motivation influencing communication opportunities for patients such as independent practice of communication therapy tasks, and social opportunities with patients and hospital staff.

Facilitators to communication

Hospital-related factors (facilitators to communication)

	Shared rooms/co-location encourages incidental social interactions Staff talked about use of communal areas at other hospitals which facilitated socialisation and communication during non-therapy times and during group therapy. Staff described the importance of the use of communal areas given the large number of private rooms on the ward. Patients also described the need to be co-located to promote social interaction. *Visitors provide patients opportunities for socialisation* Staff identified visitors as a facilitator to communication interaction for patients outside of therapy times during their inpatient admission. *Volunteers facilitate opportunities for patients to engage in social activities* Staff discussed the benefit of volunteers in facilitating opportunities for patients to engage in social interactions including programmes involving therapy dogs, book loaning, hand massages and taking patients off the ward. ***Staff-related factors (facilitators to communication)*** *Staff utilisation of resources promote communication exchange* Staff identified access to resources such as chat books and alternative and augmentative communication boards often facilitated communication interactions with patients with communication impairments on the ward.

	Speech pathology support and education facilities staff use of communication promoting strategies Staff-reported support and education from speech pathology staff facilitated their ability to interact successfully with patients with aphasia. *Staff knowledge and utilisation of communication strategies promotes communication activities* Staff and volunteers discussed the use of communication strategies and resources to facilitate communication on the ward for patients with a variety of communication impairments. *Individual staff factors promote communication opportunities for patients* Staff and patients talked about how individual characteristics of staff, including rapport building and being friendly, facilitated communication for patients with communication difficulties.
Limitations and applicability of evidence	Limitations: The study reported the perceptions of a small number of medical and nursing staff compared to allied health staff. The study involved exploring the perceptions of a small number of patients; a broader range of perceptions may have been expressed with a larger number of participants. Applicability of the evidence: Broadly applicable. Conducted in an Australian setting is somewhat applicable to a United Kingdom setting. The study was conducted in a private hospital involving a mixed acute and rehabilitation ward, which influences the results.

Study arms

Healthcare professionals (N = 51)
Purposeful sampling of acute and rehabilitation hospital staff was conducted to include at least one representative from each acute and rehabilitation staff group including medical, nursing, volunteers and allied health staff members who were over 18 years of age. A total of 51 staff and volunteers were recruited by contacting staff department managers who identified staff currently working or had previously worked with patients following stroke on the acute or rehabilitation wards.

Stroke survivors (N = 7)
People admitted to the acute or rehabilitation ward with an acute stroke; less than 21 days post-stroke during data collection; able to provide informed consent based on the judgement of the medical team responsible for the medical management of the patient; Glasgow Coma Scale >10; estimated total length of hospital stay greater than 14 days; adequate English proficiency to participate in interviews as determined by managing speech pathologists or medical team.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Galvin, 2009

Bibliographic Reference	Galvin, R.; Cusack, T.; Stokes, E.; To what extent are family members and friends involved in physiotherapy and the delivery of exercises to people with stroke?; Disability & Rehabilitation; 2009; vol. 31 (no. 11); 898-905

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.
Aim	To examine the views of people with stroke, their 'family members/friends' and physiotherapists on the role of the family in physiotherapy and the delivery of exercises following stroke.
Population	A survey took place with 100 family members/friends and people with stroke - this survey reports descriptive quantitative data only and so information will not be included in this extraction. Healthcare professionals N=10 10 expert physiotherapists working in the area of stroke rehabilitation. Participant characteristics: No additional information provided.
Setting	Focus groups in Ireland (Dublin area).
Study design	Two focus groups were conducted in September 2006. The focus groups were conducted in the same venue and all participants provided written consent prior to the session. The groups were held 2 weeks apart, and all participants were requested not to discuss the sessions with their colleagues in order to avoid contamination of the data. A moderator

	facilitated the meeting and a second researcher took notes during each session. Each focus group was audio-visually recorded by an independent person.
Methods and analysis	All recorded data was transcribed verbatim by the moderator. All participants were assigned a code to ensure anonymity in the transcript. The transcripts were explored by a process of reading and re-reading. On the first reading, transcripts were read in their entirety to acquire a sense of the whole. On the second reading, using line by line analysis, patterns and themes were identified and listed. A coding system was developed in order to facilitate the identification of recurrent patterns and themes. Prior to the third reading, the responses from all participants to each question were transferred to Microsoft Excel for further examination. The third readying involved checking the suitability of the coding system and pursuing patterns both consistent and inconsistent with the codes defined. Three researchers were provided with the responses to all of the questions in an unencoded format; thereafter they independently coded the responses sequentially using the predefined codes. The researchers disagreed on the coding system outlined for two responses. The first coding disagreement related to the characteristics of patients that benefit most from additional physiotherapy and the second disagreement arose when coding the characteristics of family members that are involved in physiotherapy. All coding disagreements were resolved through discussion. The original coding system was modified and further sub-divided to more clearly represent the emergent responses in the data. A fourth coder independently verified the coding system following the conflict resolution meeting. This coder was in full agreement with the revised coding system that was developed for the two responses in question.
Findings	All participants agreed that inpatients with stroke receive physiotherapy on a daily basis, 5 days per week, and that outpatients receive physiotherapy once or twice a week. The average length of treatment ranged from 30 to 60 minutes. The two groups identified particular subcategories of patients that tend to benefit from physiotherapy following stroke, for example patients that are motivated and also younger patients. In contrast, physiotherapists reported that physical and cognitive impairments as well as medical complications impede recovery. The groups also agreed that patients could benefit from more physiotherapy than is routinely provided in the inpatient and outpatient setting. One physiotherapist noted that fatigue was an issue for some of her patients in the acute setting and this this was a factor that needed to be considered in the rehabilitation programme. Participants highlighted a number of

	different roles that the family member plays in the rehabilitation process especially in terms of treatment and helping the family unit to cope. No physiotherapist perceived that involvement of family members in physiotherapy would be a cause of additional strain to the family and reported that families are often motivated and eager to participate in physiotherapy. The groups reported routinely involving family members in the rehabilitation process. Furthermore, a number of issues were identified that influenced participation in physiotherapy, such as level of interest and motivation of family members, availability and importance of education. Participants were also asked if they provided written information for these family members on how to perform particular exercises. The primary answer was that physiotherapists provided individual written programmed if they deemed that it was necessary to provide the same. One reported occasionally using an exercise log to document completion of exercises. However, all other participants followed up with the patient verbally. The group reported some negative experiences when involving family members and highlighted incidences where the family were over enthusiastic, very emotional or overly critical of the patient's performance and therefore would always ask the patient prior to the involvement of the family. Again, motivation of the family was mentioned as a contributory factor for success.
Limitations and applicability of evidence	Limitations: Samples of convenience were used which may have introduced a systematic bias. Finds are specific to the participants who took part in the research. The use of two different data gathering methods could have limited the study's ability to make the data of the three groups of persons comparable. Applicability of evidence: Broadly applicable. Ireland setting.

Study arms

Healthcare professionals (N = 10)
10 expert physiotherapists working in the area of stroke rehabilitation.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Major limitations

Galvin, 2009

Bibliographic Reference	Galvin, R.; Cusack, T.; Stokes, E.; Physiotherapy after stroke in Ireland: a qualitative insight into the patients' and physiotherapists' experience; International Journal of Rehabilitation Research; 2009; vol. 32 (no. 3); 238-44

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.

Aim	To examine the experience of inpatient physiotherapy intervention delivered after stroke in Ireland from two different perspectives: that of the person with stroke and that of the physiotherapist.
Population	People with stroke N=10 People with a diagnosis of first stroke, attending physiotherapy at the time of selection and willing to give informed consent to take part in the study. Had been recruited from a sample of convenience of people with stroke in two acute stroke inpatient hospitals in the greater Dublin area. People were not considered for the interview if they presented with a diagnosis of another neurological condition such as Parkinson's disease or multiple sclerosis, had a cognitive impairment or a diagnosis of expressive or receptive dysphasia. Participant characteristics: Age (range): 73 (56-88) years. Female:Male = 6:4. Days post-stroke (range): 58 (31-89) days. All were independent in their daily activities. 8 reported receiving physiotherapy on a daily basis for 30-45 minutes. Healthcare professionals N=10 Senior physiotherapists, all currently employed in the area of stroke rehabilitation. Participant characteristics: 10 physiotherapists. Female:Male = 9:1. 7 were senior therapists for more than 5 years, 1 was a senior therapist for 3 years, two were staff-grade and had completed rotations in the area of stroke rehabilitation (with at the time of the focus group more than half of their caseload consisting of people with stroke).
Setting	People with stroke were interviewed while therapists took part in one of two focus groups. Setting was in Ireland with participants from the greater Dublin area.

Study design	Semi-structured interviews were conducted with people after stroke. Questions were prepared in advance by the authors after reviewing the literature. Three areas were highlighted for exploration including the duration and content of the persons' physiotherapy programme. the role of their family in their physiotherapy programme and their views on the concept of family-assisted exercises as an adjunct to their routine physiotherapy. Suitable participants were identified in each hospital in consultation with the senior neurological physiotherapist. Each potential participant was provided with a participant information brochure before obtaining written consent. All interviews were conducted by the same researcher, who was unknown to the individual with stroke, in a prebooked meeting room in each hospital. All interviews were audio-recorded for later transcription and analysis. Focus groups were conducted with the physiotherapists. Three topics were identified as relevant for discussion in advance through literature reviews. Questions were prepared in advance by the authors to guide and develop the discussion in these thematic areas. The first theme focussed on the frequency, duration and benefits of physiotherapy. The second and third themes covered the role of the family in the rehabilitation process and the level of involvement of families in physiotherapy. Two focus groups were conducted in September 2006. They were held 2 weeks apart. All were requested not to discuss the sessions with their colleagues in order to avoid contamination of the data. A moderator facilitated the meeting and a second researcher took notes during each session. Each focus group was audio-visually recorded by an independent person for later transcription and analysis.
Methods and analysis	All recorded data from the semi-structured interviews and focus groups were transcribed verbatim by an independent person. All participants were assigned a code to ensure anonymity in the transcript. This involved examining the transcripts line by line and coding responses that emerged from the data into themes. Initially, the transcripts were read in their entirety to acquire a sense of the whole. On the second reading, using line-by-line analysis, patterns and themes were identified and listed. A coding system was developed to facilitate the identification of recurrent patterns and themes. Before the third reading, the responses from all participants to each question were transferred to Microsoft Excel for further examination. The third reading involved checking the suitability of the coding system and pursuing patterns both consistent and inconsistent with the codes defined. Three independent researchers were given the semi-structured interview transcripts and the focus group transcripts in an unencoded format and were requested to independently code the responses in succession using the predefined codes. Analysis of intra-rater reliability of the researchers coding the interviews of people with stroke revealed three areas of disagreement. The first disagreement related to the components of their physiotherapy programme that the people with

	stroke liked the most. The second related to the acceptability of family involvement in their rehabilitation programme and the third disagreement arose while describing desirable attributes in a physiotherapist involved in the rehabilitation of people with stroke. In relation to analysis of the data from the focus groups conducted with the physiotherapists involved in stroke rehabilitation, two disagreements arose. The first coding disagreement related to the characteristics of patients who benefit most from physiotherapy and the second disagreement arose when coding the characteristics of family members that are involved in physiotherapy. All coding disagreements were resolved through discussion. The original coding systems were modified and further subdivided to more clearly represent the emergent themes in the data. A fourth coder independently verified the coding systems after the conflict-resolution meeting. This coder was in full agreement with the revised coding systems developed for the responses in question.
Findings	**Duration of physiotherapy** There were several concordant opinions and similarities between the perspectives of people with stroke and physiotherapists. Both groups agreed that people with stroke could benefit from more physiotherapy than they routinely receive, which according to the therapists varied from 30 to 60 minutes a day five times per week. However, physiotherapists suggested that additional therapy would be most beneficial on discharge from hospital, whereas nine of the 10 participants with stroke reported that they could benefit from more additional physiotherapy during their inpatient stay. There is still considerable uncertainty in the physiotherapy profession regarding the process and timescale of recovery poststroke because of a lack of evidence. **Involvement of family members in physiotherapy** All physiotherapists reported that they 'routinely' involved families in the inpatient treatment programme. Contrary to this, seven participants with stroke reported that their family members had not been invited to attend physiotherapy sessions even though this was acceptable to the person with stroke and the family were happy to do so. This inconsistency may have arisen for a number of reasons, the most likely being the lack of availability of family members at the time of treatment.

	However, where possible, family involvement should be a primary goal in the rehabilitation of people with stroke and prearranged times of attendance should be organized with families to maximize involvement. **Role of the families in rehabilitation** People with stroke identified several potential benefits to themselves and their families, should their families be involved in their rehabilitation process. Therapists reported that younger and more motivated patients benefit most from physiotherapy after stroke. However, in order to develop patient motivation, physiotherapists need to encourage patients and their families to believe that physiotherapy is effective and families can assist in motivating the patient to participate fully in their rehabilitation programme. Physiotherapists also reported that cognitive impairment could impede recovery because of limited carryover by the patient. **Characteristics of physiotherapists** People with stroke also identified encouragement and honest as two important characteristics in a physiotherapist involved in the rehabilitation of a person with stroke. Although physiotherapists need to encourage patients to participate in physiotherapy, they also need to be pragmatic and discourage overoptimistic expectations that may develop through the process. Finally, both therapists and people with stroke reported that families are eager and motivated to participate in the physiotherapy and that their involvement can be advantageous both physically and emotionally.
Limitations and applicability of evidence	Limitations: Samples of convenience were used which may have introduced a systematic bias. In addition, the number of patients selected for the study was small. Different qualitative methodologies were used for the patient and the physiotherapist which may have affected the results. The findings are specific to the participants who took part in the research. Applicability of the evidence:

	Broadly applicable. Setting relatively similar.

Study arms

People with stroke (N = 10)
People with a diagnosis of first stroke, attending physiotherapy at the time of selection and willing to give informed consent to take part in the study.

Healthcare professionals (N = 10)
Senior physiotherapists, all currently employed in the area of stroke rehabilitation.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Gustavsson, 2020

Bibliographic Reference	Gustavsson, Martha; Ytterberg, Charlotte; Guidetti, Susanne; Exploring future possibilities of using information and communication technology in multidisciplinary rehabilitation after stroke – a grounded theory study; Scandinavian Journal of Occupational Therapy; 2020; vol. 27 (no. 3); 223-230

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.
Aim	To explore how healthcare professionals use and could potentially use ICT to enable a person-centred rehabilitation process after stroke.
Population	Healthcare professionals N=12 Occupational therapists, physiotherapists, speech and language therapists and medical social workers from different workplaces within rehabilitation after stroke (acute and primary care rehabilitation). Six professionals (three from acute rehabilitation and three from primary care rehabilitation) participated in individual interviews. However, the views of potential future use needed to be further explored and so was done within focus group interviews, with 12 people from nine different neurological rehabilitation teams were involved. Participant characteristics: None stated.
Setting	People from acute rehabilitation and primary care rehabilitation in Stockholm, Sweden. Occurring over two focus groups held in November 2015 (with the initial interviews taking place from April to October 2015 in the person's workplace).
Study design	The first six individual interviews were conducted by the second author at the participants' workplace. Two focus group interviews comprising 12 participants in total and two moderators in each group (the authors plus an additional researcher

	from the research group) were conducted in November 2015. All participants received written and oral information about the study, were guaranteed confidentiality and informed that they could withdraw their consent at any time. The data collectors and moderators were researchers with several years' clinical experience of rehabilitation after stroke. An interview guide was developed by the authors containing a few open-ended questions based on the aim of the study. The questions regarded the professionals' perception of the potential barriers and facilitators for using ICT within rehabilitation after stroke. The interview guide was used as a flexible tool that allowed the participants to reflect on the topic and tell their stories rather than merely answer questions. All the interviews were audio recorded and transcribed verbatim.
Methods and analysis	A constant comparative method, moving back and forth in the material, was used to analyse the transcribed interviews. NVivo software was used to sort and organize the data. Memos were written throughout data collection and analysis to assist in the analysis process and to capture developing ideas around the material. Analysis started during data collection in accordance with the grounded theory approach and the first stage was initial coding through comparison on an incident-by-incident basis. Analysis of the transcribed interviews was mainly performed by the first author. However, it was continually discussed by all authors throughout the process. The constant comparative method was used as an analytic tool throughout the study to guide the data collection and create a new understanding of the collected data. The initial codes were kept close to the text and organized into 11 categories that described different areas in which ICT was used in rehabilitation. When progressing to focused coding and integration of the categories, the categories were revised. The seven new categories created at this stage reflected the reasons for using ICT within rehabilitation after stroke. In order to further deepen the conceptualisation and describe the relationship between the categories, a theoretical coding was used. The results from previous studies that describe the importance of sharing and transparency in a client-centred intervention for rehabilitation after stroke were used to create the four categories presented in the results.
Findings	**Sharing of information** Sharing information was one of the areas in which professionals saw a potential for ICT to be used to provide essential information to patients and their significant others, to help them feel in control and to own their rehabilitation process. The professionals noted that managing and understanding information regarding their medical care and rehabilitation was problematic for many of the patients. This was evident during both acute stroke care and when adjusting to life at home after discharge. Overall communication and information to patients and significant others were primarily provided orally through face-to-face meetings or via telephone and through written information. They discussed how ICT could be used as

a digital coordinator, to keep track of contact information, referrals and appointments and provide accessible and updated information. It could also be used in the process of choosing physical aids and adaptations for their use.

Even thought most of the professionals lacked access to smartphones and secure ways of communicating online, they were mainly positive to such a method of sharing information and considered it to be a useful way of communicating. On the one hand, the professionals expressed their desire to use ICT in order to enable patients to take control of their rehabilitation process while, on the other hand, they expressed difficulties such as a lack of accessible and understandable information, or a lack of ICT.

Collaborating from a distance

The professionals stated that they felt that resources to meet all the patients' needs were sparse, both at the acute stroke care units and within primary care, and that ICT could be a useful and effective tool for collaborating from a distance. The professionals stressed that ICT should be considered to be a supplement and not a replacement for normal rehabilitation and that it could have several benefits if used carefully. Some of the professionals used computer software for home training for the patients. They described this as increasing independence, as well as intensity level and motivation in the rehabilitation process. However, a prerequisite was that patients were able to download applications and software on their own devices. Moreover, they had to be able to pay for this themselves.

The professionals discussed the possibilities of using ICT to enhance communication and follow up the progress of rehabilitation from a distance, for example, through videoconferencing. These solutions could save time and money through less travel, both for professionals and for patients. The main obstacles to communicating through ICT were a lack of secure methods for transferring personal data, and the reimbursement system. The rehabilitation teams were only reimbursed for a follow up if they met patients face-to-face. Being able to share the progress of the rehabilitation and communicate from a distance were considered to generate a sense of closeness and be motivating for both patients and professionals. Regarding the future development of ICT, the professionals stated that solutions should be easy to use by the patients, regardless of their reduced abilities and be meaningful for all.

Having transparency in the documentation

Current use of documentation was mainly limited to medical records that were also often used to communicate with other professionals within the team or on other units. There was a desire to collaborate more closely with patients and colleagues using ICT. The professionals stated that they used ICT mainly in their offices for administration purposes, searching for information and for contacting other professionals. The use of ICT together with patients was limited, since only a few of the professionals had access to smartphones or laptops. Making assessments, setting goals and planning rehabilitation were stated as being essential parts of the rehabilitation process, and particularly important when the rehabilitation periods are short. The professionals stated that these were documented manually on paper together with the patients and were later transferred to digital medical records which were not easily accessible to the patients. The professionals lacked access to suitable ICT-supported assessment tools that could allow them to document assessments directly on a tablet that could facilitate performance and administration of each assessment. Even though medical records were open to patients on request, they were not easily accessible by patients or their significant others.

Collaboration with professionals at other units was regarded as important for a smooth transition for patients. Currently, the primary method of communication is through documentation in the medical records. However, because this was one-way communication, there was no guarantee that the information had been read and understood. Several professionals wanted more collaboration and wanted to be able to talk to other professionals when handing over patients. This could benefit everyone and support the professionals to develop within their professional role through feedback. A number of professionals attempted to phone their colleagues, but it was not always easy to find time and the opportunity. ICT could increase transparency between different stakeholders and could enable communication and collaboration between everyone.

Supporting patients' use of ICT

The professionals stated that the patients' ability to use ICT was often affected by the stroke to a greater or lesser extent, while the need to use ICT in everyday life also increased. The professionals stated that there was a need for them to assess the patients' ability and need to use ICT in their everyday lives, including rehabilitation after stroke, and then offer

	support. However, no guidelines existed for when, how and by whom these assessments should be performed. The occupational therapists sometimes assessed the patients' ability to use their mobile phone, tablet or computer after a stroke as part of their assessment of the patient's ability to perform activities of daily living. One of the professionals stated how support was offered to enable patients to use ICT as they had done previously. In addition to the impact of a stroke, the professionals' felt that other factors influenced the use of ICT in everyday life such as insecurity, previous experience, interest and access to devices and/or software.
Limitations and applicability of evidence	Limitations: The majority of participants were in primary care services and so the results may be more applicable to this population (primary care professionals were represented in the focus groups and interviews, but acute care services were only represented in the interviews). No medical social workers were involved. Applicability of the evidence: Broadly applicable. Sweden health setting. Discusses a primary care and acute care setting which appears transferrable to a UK health model. Mildly relates to intensity of rehabilitation.

Study arms

Healthcare professionals (N = 12)
Occupational therapists, physiotherapists, speech and language therapists and medical social workers from different workplaces within rehabilitation after stroke (acute and primary care rehabilitation). Six professionals (three from acute rehabilitation and three from primary care rehabilitation) participated in individual interviews. However, the views of potential future use needed to be further explored and so was done within focus group interviews, with 12 people from nine different neurological rehabilitation teams were involved.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Hartford, 2019

Bibliographic Reference	Hartford, W.; Lear, S.; Nimmon, L.; Stroke survivors' experiences of team support along their recovery continuum; BMC Health Services Research; 2019; vol. 19 (no. 1); 723

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.
Aim	To gain insight into healthcare and social structures from the perspective of patients and caregivers that can better support long-term stroke recovery
Population	Stroke survivors N=16

	Participant characteristics: Female:Male = 5:11. Mean age (range): 68.75 (48-87) years. Marital status: Married/common law = 9, single = 1, widowed = 4, separated/divorced = 2. Mean duration of stroke (range): 8.74 (3 months - 26 years) years. Work status: Unemployed = 6, retired = 8, volunteer = 1, employed = 1. Extended medical coverage: yes = 5, no = 6, private funds = 5. Spouses of stroke survivors N=4 Participant characteristics: Female:Male = 4:0. Mean age (range): 73.5 (62-80) years. Work status: Retired = 3, employed = 1. Interview: With partner = 2, without partner = 2. Stroke recovery group co-ordinators N=3 Participant characteristics: Female:Male = 3:0. Speech pathology N=1 Female:Male = 1:0.

Setting	The study took place in a major city in Western Canada. Data was collected in interviews with the majority of interviews taking place on the premises where the recovery groups held their meetings to accommodate the patients' limitations. Canada has a universal healthcare scheme (Medicare) which provides access for all Canadian residents to medically-necessary hospital and physician services. Medicare funding is provided by Federal, Provincial and Territorial governments. Health insurance plans are the responsibility of Provincial and Territorial governments. Allied health and alternative therapy services coverage are, in general, not funded in this Western Canadian province. Extended healthcare plans, which may fully or partially cover additional services, are available through employment schemes or as individuals. Individuals without extended healthcare pay in full for additional services.
Study design	Two researchers conducted the project. A qualitative descriptive design was used to elicit participants' descriptions of their stroke recovery experiences within the Canadian healthcare system. The researchers sought a sample size to capture various multifaceted perspectives of stroke recovery. In addition, the researchers used a combination of purposive and convenience sampling to recruit participants from locations where participants of interest (stroke survivors and various caregivers) would be present in sufficient numbers. Information, provided by a city stroke rehabilitation centre, indicated that community stroke support groups may be an appropriate recruitment site for prospective participants. The sample size for spousal caregivers was determined by the caregivers who were present with stroke survivor partners who consented to be interviewed. The sample size of other caregivers, identified as coordinators or therapists, was determined by their availability at the stroke rehabilitation groups. The interviews were conducted between September 2015 and Feburary 2016. The majority of the interviews took place on the premises where the recovery groups held their meetings to accomodate the patients' limitations (wheelchair access and ability to travel to the interview location). At all facilities a private room was provided for interviews. Three interviews were conducted in participants' homes and one interview in a hospital cafeteria. One author conducted face-to-face interviews with all 24 participants. The researchers developed a semi-structured interview guide for the study. Questions were developed to identify how patients' preferences, goals and values were considered in their treatment decisions. The researchers also explored concepts of empowerment, autonomy, power and agency and control in interactions with healthcare providers using open ended questions. As data collection progressed, interview questions were refined to gather insights into emerging concepts or to inquire about a critical area, such as identifying members of an individuals' healthcare team. Specific questions pertained to treatment goals, communication and interaction between healthcare team members, healthcare team support, role on the healthcare team, and experiences of empowerment. All interviews were audio-recorded. Interviews ranged in length from 17 minutes to 1 hour and 32 minutes. The majority of interviews were in the range of 30-40 minutes.

	In addition to the interviews, the interviewer took field notes of each interview. These notes documented their observations, emotions and reflections of the interviews. Observations of interest included participants' mobility, behaviour, interactions with their partner if present. Additionally, field notes captured how to interview proceeded and the contextual environment where data collection took place. Furthermore, the researchers employed the concept of data saturation and collection of rich and thick data. When no new data, themes or coding arose from the analysis, the researchers considered the quality and quantity of the data against the research questions and analytical lens. Data collection increased when a robust understanding of the phenomenon emerged in analysis.
Methods and analysis	The audio-recorded interviews were transcribed, coded, and analysed concurrently by two reviewers using NVivo 11 QSR International. We employed a three stage qualitative analysis approach to facilitate the exploration of participants' experiences of managing stroke as described by LeCompte and Schensul. This inductive analysis involved item analysis which generated conceptual statements concerning patterns of relationships in the data which produced general insights into our topic or interest. Initially one researcher examined the data and grouped items of interest as primary codes for data organisation. In addition to grouping similar items, dissimilar or competing items were sought to reduce researcher bias and premature judgements. Approximately 50 codes were generated. As the item analysis progressed, one researcher observed that participants experience difficulties having their needs fulfilled in relation to attaining what they perceived to be their full recovery potential. It began to emerge that these stroke survivors and their informal caregivers were not well supported by the healthcare system. Throughout item analysis two researchers discussed and refined the codes and developed pattern codes. Noticing the sentiments of a lack of support made by patient caregivers, one researcher drew on an empowerment lens for the third stage of analysis (structural analysis) which identified broad theoretical themes such as socioeconomic differences, treatment inequities and support mechanisms. At this time, review was sought from a third researcher to enhance this reflective analytical process and enhance research credibility.
Findings	**Experiences of managing stroke** *Unmet needs* Unmet needs, inequitable access to resources and a sense of frustration with the healthcare system. The participants described two recovery centres, one larger and one smaller, with a preference for the larger one due to its reputation for intensive therapy provision. Several survivors and caregivers expressed dissatisfaction most often when a preferred treatment or rehabilitation program was denied due to the stroke survivor's age or perceived lack of potential to improve.

Descriptions provided by stroke survivors and caregivers indicated their perceptions of their capabilities, therapeutic needs and expectations for the future often differed from those of their healthcare providers. A stroke survivor described being told that they had plateaued and they must accept "this is as good as it gets", and Nicholas' rehabilitation assessment indicated he would never talk and walk again. Implicit in descriptions of limited opportunities for recovery and unsupportive conversations with some health professionals was a sense of being "written off". They also indicated that while the stroke survivor received several rehabilitation assessments their goals for rehabilitation were not taken into account. A stroke survivor suggested that healthcare providers, such as physiotherapists, had limited their physical recovery as they tended to rely on test results and theoretical expected progression to determine therapy. This information was prioritized over their perception of their capabilities and expectations.

Participants also alluded to the limitations of stroke rehabilitation programme. A stroke survivor and spouse both reported that scheduled therapy sessions were often cancelled due to unavailability of rehabilitation staff. Another spouse suggested that essential intensive therapy was minimal and not prioritized by the healthcare system.

Fulfilling unmet needs

Stroke survivors expressed a desire to get better and thus persevered despite the many structural barriers they encountered. To obtain the therapy and support they needed stroke survivors and spousal caregivers reported advocating for their preferred rehabilitation program, and organising their own homecare, physiotherapy, speech therapy, exercise opportunities and other support requirements. Several participants indicated that advocacy and being empowered was part of their role, or responsibility, as a stroke survivor or a caregiver. A stroke survivor stressed the importance of having an advocate as he perceived that as a patient he was often not listened to. They reported their spouse had advocated for them for more inpatient rehabilitation by refusing to take him home. Another stroke survivor described how they drew on the services of a lawyer to successfully appeal to their strata corporation to make her condominium building wheel chair accessible. Several participants indicated they did not feel empowered regarding stroke treatment and management throughout recovery, while a spouse despondently responded that "you have no choice", implying that you have to take charge.

Participants' recovery descriptions identified characteristics such as determination, motivation, and perseverance which had help them to regain some of their lost functionality. A survivor had regained his ability to walk and speak over a period of 6-12 years. Being told his therapist that there would be no more improvement had motivated a stroke survivor to improve their left hand function. A third survivor desire to regain speech helped him to persevere with speech therapy, and a fourth survivor indicated that their assertive and stubborn personality had supported her recovery. People also described how they obtained the therapy and care that they perceived they needed from available health services and community resources.

Resources of support

Financial support

The analysis suggested that socioeconomic status significantly impacted stroke management, particularly with respect to fulfilling rehabilitation needs to optimize stroke survivor outcomes. Participants indicated that the cost of stroke rehabilitation could be high and not all stroke survivors were financially equipped to self-fund the rehabilitation mechanisms they considered necessary. While several stroke survivors reported having medical insurance (which covered some or all post discharge rehabilitation therapy requirements) others paid out of pocket for these services. However, several stroke survivors were recipients of disability allowance, their only source of income, and were unable to pay privately for services. They relied on limited resources available to them in the healthcare system and local community. A stroke survivor made use of low cost yoga for other chronic conditions which he adapted to his needs. Stroke recovery groups also provided low cost access to limited rehabilitation therapy. However, stroke survivor group co-ordinators and the speech pathologist identified lack of funding as a potential barrier to providing rehabilitation services for stroke survivors and caregivers.

Homecare encompassed a range of services such as nursing care, help with bathing, laundry, and food preparation. A stroke survivor had the financial means to employ a full time housekeep who took care of all of these services. However, the majority of stroke survivors where dependent on inadequate and inconsistent homecare services provided by the healthcare system. Two stroke survivors received very limited homecare, despite their significant disabilities, which impacted their food preparation, house cleaning and bathing capabilities.

Social support

Social support seemed to make a notable contribution to the recovery and well-being of stroke survivors and spousal caregivers. Most stroke survivors indicated that they were supported by a spouse, other family members and/or friends. Stroke survivors and spouses also concurred that stroke recovery groups were an important factor for stroke recovery. A strokes survivor indicated stroke recovery groups substituted for the lack of rehabilitation discharge follow-up by providing an environment where stroke survivors could obtain therapy services, as well as emotional support. In addition, stroke recovery groups offered a place where stroke survivors could meet, develop new friendships and rebuild their lives. Participants described stroke recovery groups as nurturing places where members did not feel self-conscious about their physical and cognitive limitations. A stroke survivor descried how stroke survivors could learn from each other which helped in setting goals. Stroke recovery groups also provided stroke survivors with access to practical resources: such as community volunteer assistance filling tax returns and opportunities for learning about practical tools to aid recovery. Groups also provided information about community resources: such as homecare services and opportunities for volunteers.

Stroke survivor groups were described as empowering because they were a space where stroke survivors interact, support and learn from each other. A stroke coordinator described how leaders and members of the stroke recovery groups collaborated to identify members' abilities and work with them to further their recovery. She also reported how a member had taken on the role of treasurer and helped her with: a) typing letters, b) preparing an earthquake readiness program; c) raising money for their group by presenting their program to other stroke survivor groups. Despite the benefits these groups offered members, the co-ordinators and speech pathologist alluded to limited healthcare system support for the group in terms of referral.

Stroke survivor group co-ordinators experienced barriers to promoting their groups such as not being allowed to hand out resource pamphlets in stroke units. They expressed frustration about how stroke healthcare appeared to be focused on the acute care setting rather than extended community care. Stroke survivors were also concerned about lack of publicity and reluctance of in-patient rehabilitation facilities to refer stroke survivors due to "privacy issues". Stroke survivor group co-orindators' descriptions of past experiences suggested that stroke recovery groups had, in the past, been more connected

	with the community healthcare system in terms of liaison with hospitals, and interactions with visiting stroke recovery therapists.
Limitations and applicability of evidence	Limitations: Findings are specific to the healthcare system and community resources that participants experienced. The recruitment process was limited to participants from stroke recovery group attendees and their findings may not be representative of stroke survivors not attending stroke recovery groups. Seeking out and accessing stroke survivor groups may imply that stroke survivors and caregivers were already empowered. Another limitation is the representation of specific participants; recruitment was dependent on the person present at the three locations at the time of recruitment and their desire to participant. This resulted in a gender imbalance. Recruitment of spousal caregivers was dependent on the consent of stroke survivors and caregivers. Only one female stroke survivor was married and consent was not provided to interview their spouse. The spouses of four male stroke survivors consented to be interviewed. A small number of stroke group co-ordinators and one speech pathologist were recruited due to the purposeful convenience sampling approach used. A limitation of the demographic survey was that it did not explore underlying co-morbidities, pattern of deficits or income which may have provided deeper insight into how stroke survivors and their caregivers managed stroke. Applicability of evidence: Somewhat applicable. Healthcare setting is a bit different as it mixed public and private healthcare settings in a way that is not totally applicable to a UK setting. However, the themes that are appropriate to use in the analysis are appropriate regardless.

Study arms

Stroke survivors (N = 16)

Spouses of stroke survivors (N = 4)

Stroke recovery group co-ordinators (N = 3)

Speech pathologists (N = 1)

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Hitch, 2020

Bibliographic Reference	Hitch, D.; Leech, K.; Neale, S.; Malcolm, A.; Evaluating the implementation of an early supported discharge (ESD) program for stroke survivors: A mixed methods longitudinal case study; PLoS ONE [Electronic Resource]; 2020; vol. 15 (no. 6); e0235055

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.
Aim	To describe staff perceptions of the trial of an early supported discharge model of care for stroke survivors at a large metropolitan public hospital in Australia.
Population	Healthcare professionals N=23 Two groups: staff who referred patients for early supported discharge and staff involved in the planning, implementation or delivery of early supported discharge during the trial. All health service staff meeting these criteria were invited to participate in each time point, and could participate in all, some or none of the data collection. Participants included medical, speech therapists, neuropsychologists, occupational therapists, physiotherapists, nursing and administrators. 7 participants were interviewed, while 16 participated in focus groups. In addition, qualitative elements from surveys were used, including at time 0: 20 delivering staff, 26 referrers; at time 1: 14 delivering staff, 18 referrers; at time 2: 14 delivering staff, 19 referrers.
Setting	A public health organisation located in a major Australian city. The organisation delivered acute tertiary, subacute, specialist ambulatory and community-based services to a community of approximately 800,000 people. Service locations including three acute hospital campuses, a day hospital and a transition care program, and the health workforce numbers approximately 6,500 staff. Prior to 2017, this organisation did not offer early supported discharge to stroke survivors with a lot of people facing significant delays before receiving Community Based Rehabilitation following discharge, and were only eligible for once weekly physiotherapy during post-acute care for up to 30 days while waiting.
Study design	A mixed methods case design (only the qualitative component is considered for this review, as per the protocol). The study design was informed by the Consolidated Framework for Implementation Research (CFIR). This describes constructs identified from previous research as influential on effective knowledge translation. The framework supports analysis of the relationships between constructs and implementation outcomes. All domains were addressed during the collection of data. Two data collection approach were used, mixed methods surveys and qualitative semi-structured interviews and/or focus

	groups. Surveys were undertaken with both Referrers and Delivering Staff at three time points, while focus groups and interviews were conducted with Delivering Staff only at the final time point.
Methods and analysis	Qualitative survey data, and from interviews and focus groups, was analysed using a priori thematic analysis, with the CFIR constructors as codes. a codebook was developed from the definitions for each domain and construct and including illustrative examples from the transcripts. Two researchers independently assigned an interpreted meaning to each passage, on a line-by-line basis, for 25% of the transcripts. Very few instances of divergence existed (3.23% of total codes), and these were resolved via discussion between the researchers. A single researcher then assigned interpreted meanings to passages in all other transcripts. Two other researchers independently reviewed these codes against the code book, and again low rates of divergence were found and resolved by consensus. Key relationships between the CFIR domains and constructs were also analysed at the conclusion of qualitative analysis. The code co-occurrence function of the Dedoose platform was used to describe relationships between these concepts, which assigns frequencies to codes assigned to overlapping excepts. These relationships were then displayed in a network group with constructs related to at least 3 other constructs identified as being key to staff experience. All data sources for each CFIR domain and construct were then integrated in the final, mixed methods analysis. Within each construct, instances of consonance and dissonance between the data sources were described, and finally synthesised at the domain level.
Findings	**Characteristics of the individual** Participants perceived their personal characteristics and attributes in relation to ESD fairly positively throughout the trial. Greater improvements in overall perceptions occur in both groups during phase 1, however increases in overall knowledge occurred during different phases for each participant group. Staff generally perceived ESD as closely aligned to their personal and professional beliefs about best practice and early intervention. Providing rehabilitation at home was also identified as a key aspect of ESD, which enabled meaningful goal setting and client centred practice. However, ESD implementation was both congruent with, and challenging to, their existing rehabilitation practice knowledge. Referrers noted that Grade 1 staff required increased support in Phase 1 to develop self-efficacy, while staff noted ESD knowledge was not consistently developed for staff members joining the organisation mid-trial. A key tension identified was the belief that offering early supported discharge to the trials' treatment group provided those patients with an unfair advantage. An unintended consequence of these beliefs was an emphasis on the shortcomings of standard practices, which remained in place for most patients. Diverse beliefs around the time commitment required by ESD were also evident, with consistent (but not universal) claims of increased workload made throughout this study. Staff

reported generally positive organisational perceptions, which supported a sense of commitment, enthusiasm and pride specifically associated with the ESD trial.

Intervention characteristics

Participants also maintained generally positive perceptions about ESD itself. A mixed profile of changes was found, with some constructs experiencing only moderately fluctuations and others changing more markedly in specific phases. Decreases in some constructs (such as number of steps, degree of difference and cost) represent positive responses, as these are constructs were less is better. Participants were generally well aware of the origin of ESD and its supporting evidence, which was perceived to provide support for good patient and service outcomes. ESD was unequivocally perceived to have more advantages than other stroke rehabilitation programs (as indicated by the perceived disparity between ESD and standard practices). These advantages were perceived to come at no cost or disadvantage to patients, fulfilling both their and the service's needs.

Perceived adaptability of ESD was identified both within the intervention, and as a function of the deployment of available resources (an Inner Setting construct). Perceptions of the duration and scope of ESD also became more positive, with duration influenced at times by staff attempting to meet their commitment to client centred practice. Perceptions of scope increased perceptions about complexity were expressed in a relative sense, in relation to other interventions and systems. While quantitative data indicated decreased costs perceived over time, some participants expressed cynicism about the implementation of ESD as a primarily cost cutting measure within their qualitative responses. The trial funding did not include additional staffing, and so participants had supported its implementation within their usual duties, leading some to question if identified cost savings were 'real'.

Outer setting

The most prevalent construct identified was patient needs and resources, which was expressed from two perspectives - the general needs of patients at this organisation, and the specific needs of patients and carers in the early stages of stroke recovery. Staff discussed the impact of poverty, disadvantage and migration experiences within the local community on

ESD, nothing that the model of care supports the use of interpreters via advance booking of appointments. Participants also highlighted that stroke survivors were not the only patient group which could potentially have their needs met through ESD models of care. A major patient need met by ESD was returning home, which was perceived to be the optimal recovery environment. Staff reported that both patients and carers shared this perception, reacting positively to the prospect of ESD when initially approached. However, participants expressed concerns about ESD's ability to meet family needs in early recovery, particularly as patients are returning home with higher levels of dependence. A possible response suggested by staff was extending the ESD model beyond patients to support family and carers, who were acknowledged as key stakeholders.

Inner setting

Perceptions relating to the Inner Setting domain were mixed. Staff generally perceived ESD as aligning closely with organisational norms and values, particularly around the provision of best care and an organisational commitment to innovation. Perceptions of an innovative culture may also relate to the overall implementation climate; however, other aspects of this construct (goals and feedback, learning climate, organisational incentives and reward) had very limited presence in the data. The relative priority of ESD within the organisation was understood by staff to interact with competing priorities, however they perceived a strong tension for change. Referrers reported more negative perceptions of ESD's impact on workload than staff, however qualitative responses indicated this was expected and was "manageable given good planning and organisation". ESD was not initially perceived as compatible with the CBR context, with several participants describing feeling forced to choose between models of care rather than adopting a hybrid approach. These concerns manifested themselves in changed to long held practices, which were particularly challenging for some of the smaller professions and non-clinical staff. While these changes were perceived as a positive opportunity to work in new ways by some, others found they challenged beliefs around the core business of CBR.

Process

Overall, perceptions of the implementation process remained steady for both referrers and staff over time. As expected, planning was not a strong theme in the data. However, some staff reflected on the value of reviewing organisational data, workforce consultations and benchmarking against other services to inform the trial process. Attempts were also made to anticipate potential process and workflow issues, and differing perceptions between stakeholders, although this proved to

	be difficult without precedents and prior experience. High levels of staff investment were consistently identified as important by participants, and additional investment provided by management and informal ESD leaders (such as team leaders, managers, the steering committee, nurse unit managers and nurse practitioners) was also recognised within the CBR service. This solid engagement was attributed both to the perceived alignment between ESD and best care, and workforce perceptions of being able to meaningfully influence implementation. While opinion leaders and external change agents were not discussed in this data, the ESD co-ordinator was consistently identified as a key champion. Perceptions of her role were universally positive, with accessibility, excellent clinical knowledge, face-to-face attendance of team meetings, an ability to work across service boundaries and a single point of contact and coordination highlighted as key factors contributing to its success. The intensive nature of ESD continuously challenged its execution over time, with the ability to retain flexibility perceived as crucial by participants. The early stages of ESD execution were experienced as uncertain by some, however there was a sense the workforce could abide with it and understood uncertainty was a necessary part of the implementation process. By T2, most participants expressed considerable satisfaction and confidence with the ESD trial at this organisation. Despite the challenges identified at previous time points, ESD was now perceived as "business as usual and so we sort of know how it works and know what's happening". However, not all staff were completely comfortable with ESD by this point, indicating six months was not sufficient time for everyone to fully adapt to the new intervention. By the trials conclusion, participants generally believed they had enough evidence to support its ongoing sustainability.
Limitations and applicability of evidence	Limitations: The main limitation was that it was a single health service and a relatively small geographic area and so may not be generalisable to other health services. The adoption of CFIR lead to limitations of the framework (including its scope, number of constructs and previously mentioned comments on the construct of complexity) were present. Applicability of evidence: To this question limited applicable themes. Setting is appropriate, but the study does not seem to answer the question.

Study arms

Healthcare professionals (N = 23)
Two groups: staff who referred patients for early supported discharge and staff involved in the planning, implementation or delivery of early supported discharge during the trial. All health service staff meeting these criteria were invited to participate in each time point, and could participate in all, some or none of the data collection. Participants included medical, speech therapists, neuropsychologists, occupational therapists, physiotherapists, nursing and administrators.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Janssen, 2020

Bibliographic Reference	Janssen, J.; Klassen, T. D.; Connell, L. A.; Eng, J. J.; Factors Influencing the Delivery of Intensive Rehabilitation in Stroke: Patient Perceptions Versus Rehabilitation Therapist Perceptions; Physical Therapy; 2020; vol. 100 (no. 2); 307-316

Study details

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

Other publications associated with this study included in review	Klassen TD, Dukelow SP, Bayley MT, Benavente O, Hill MD, Krassioukov A, Liu-Ambrose T, Pooyania S, Poulin MJ, Schneeberg A, Yao J, Eng JJ. Higher Doses Improve Walking Recovery During Stroke Inpatient Rehabilitation. Stroke. 2020 Sep;51(9):2639-2648.
Aim	To investigate factors influencing implementation of higher intensity activity in people with stroke and to compare this with therapists' perspectives.
Population	Adults post-stroke N=10 People after stroke from the DOSE trial from both the 2x 1 hour and 1x 1 hour trial arms who, at the start of the trial, were within the first 10 weeks post-stroke with hemiparesis in the lower extremity, able to ambulate for at least 5 m with up to 1 person maximum assist, and able to understand and follow directions. People were not included if they had language or cognitive barriers. Participant characteristics: Male:Female = 5:5. Mean age (SD): 58.7 (5.6) years. Mean time since stroke (range): 8 (3-18) months. Trial arm: 2x 1 hour = 7, 1x 1 hour = 3m. Participants 5m walk test scores at the start of the DOSE trial: 0.15-0.86m/s. Also comparator therapists were interviewed (see Connell 2018 for additional information. Data from that study was used for comparison in this study).
Setting	Participants from the DOSE trial which was conducted in 5 metropolitan centres in Canada (though people came from a mixture of settings, including major metropolitan cities and rural towns outside of these large cities).
Study design	Qualitative study embedded in a constructivist paradigm using open-ended semistructured questions. The Standard for Reporting Qualitative Research: a Synthesis of Recommendations was used. The interview guide was based on the interview guide developed for rehabilitation therapists in the DOSE study and the underlying implementation frameworks: Normalization Process Theory and the Consolidated Framework for Implementation Research. Both of these were developed to understand the factors that influence the implementation of an intervention in a clinical setting. The interview

	guide was reviewed and piloted by 2 researchers with qualitative and physical therapy experience, 1 DOSE therapist, and 2 patients from the DOSE trial who fell outside the inclusion criteria of the study. The interviews were conducted by two interviewers via telephone and Skype. Participants were informed that the conversation would be recorded and that the interviewer was not part of the DOSE research team, giving participants the opportunity to provide an honest perspective. Criticisms were welcomed. The reason for the interview was explained, and the recorder was switched on before the participants were asked about their own perceptions and experiences of being involved in the trial. Interviews lasted on average 34 minutes (range 17-46 minutes). All participants provided written informed consent and received $50 (CDN) honorarium to compensate them for their time. Interviews were digitally recorded and transcribed verbatim to enable in-depth analysis.
Methods and analysis	All participants were given a participant code, and their interviews were transcribed and imported into NVivo 12. Content analysis was used, with the CFIR as the coding framework. The CFIR provides a menu of constructs that have been associated with effective implementation and includes the following domains: individuals, intervention, inner setting and outer setting. Each domain was divided into different items. The first and second author coded the first two transcripts using the CFIR framework. Free codes arising inductively from the data were added throughout the coding period in case topics were covered that did not fit into the CFIR framework. The two authors compared their coding, reviewed differences, and agreed on codes. this was done to ensure that similar decisions were made about how to interpret the framework in the context of a patient perspective. After this, the remaining transcripts were coded by both authors and checked for accuracy. Finally, the 2 authors met again to compare and discuss their codes and then decided on their final codes. Findings were presented according to the CFIR domains. Findings from this study were then compared and contrasted against the findings of the rehabilitation therapists in each domain of the CFIR framework. Discussion between authors took place to ensure the interpretation of the framework was consistent.
Findings	**Characteristics of the individual** Note: For themes from the therapists, please see Connell 2018.

	Knowledge and beliefs Patients: Belief that extra exercise is beneficial. Limited expectations prior to study involvement (because of the unexpected nature of having a stroke, participants did not have any preconceived ideas about what the rehabilitation should look like). Limited concerns about it being too much/working too hard: actually positive about intensity/doing more. *Self-efficacy* Patients: Tended to be able to work hard and work out routines/support strategies that worked for them. *Individual stage of change* Patients: No additional notes *Other personal attributes* Patients: Exercise and lifestyle history (most people in this study had been involved in exercise or were active before their stroke). Most people active/open to exercise. **Intervention characteristics** *Evidence strength and quality*

	Patients: Personal experience rather than academic evidence. Both therapists and patients seemed to base their beliefs of the effectiveness on their practical and personal experiences rather than academic evidence. *Relative advantage* Patients: Comparison between patients while on stroke rehab unit helped reinforce positive beliefs. Participants in the 1-hour/day exercise group did not see a relative advantage (these people felt that they could have done more and did not see an advantage of being included in the DOSE study). *Adaptability* Patients: No additional notes *Complexity* Patients: Graded exercise tests accepted and not an issue. Feedback devices seen as helpful to monitor outcome but problematic when unreliable. Patients felt they were able to have structure in their day to fit in extra sessions. *Design quality and packaging* Patients: No additional notes

Content of intervention

Healthcare professionals: Treadmill--Walking--Exercise test

Patients: Walking. Positive effect of therapists. More time with therapists (who were perceived to be their coach and motivator). Without exception, the participants developed a positive relationship with the therapist team.

Inner setting

Structural characteristics

Patients: No additional notes.

Networks and communication

Patients: No additional notes.

Culture

Patients: No additional notes.

	Readiness for implementation Patients: No additional notes. *Available resources* Patients: No additional notes. **Outer setting** *Patient needs and resources* Patients: No additional notes. *External policies and guidelines* Patients: No additional notes. *Family influence* Patients: Family and friends generally supportive (both practical and emotional) during rehabilitation. Other family members needed to come around to the idea of intense therapy. On-going influence (they mentioned that a good support network was needed once you were discharged from the rehabilitation hospital).

Limitations and applicability of evidence	Limitations: There is a chance of selection bias in the sample recruited, as people with stroke who were positive about exercise and who had positive trial experiences may have been more willing to be interviewed. All people were active prior to stroke. The time between completing the trial and the time of interview might have caused some levels of recollection bias. Applicability of evidence: Broadly applicable. Canadian healthcare system is not too different from a UK perspective. Discusses people in a trial of a specific intervention, so may not be applicable to all intense interventions. In addition, most people were involved in exercise or were active before their stroke. This limits the applicability for people who may not have been active before their stroke.

Study arms

Adults post-stroke (N = 10)
People after stroke from the DOSE trial from both the 2x 1 hour and 1x 1 hour trial arms who, at the start of the trial, were within the first 10 weeks post-stroke with hemiparesis in the lower extremity, able to ambulate for at least 5 m with up to 1 person maximum assist, and able to understand and follow directions.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Kelly, 2020

Bibliographic Reference	Kelly, K.; Brander, F.; Strawson, A.; Ward, N.; Hayward, K.; Pushing the limits of recovery in chronic stroke survivors: a descriptive qualitative study of users perceptions of the Queen Square Upper Limb Neurorehabilitation Programme; BMJ Open; 2020; vol. 10 (no. 10); e036481

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	Brander F, Kelly K. Intensive upper limb neurorehabilitation in chronic stroke: outcomes from the Queen square programme. J Neurol Neurosurg Psychiatry 2019;90:498–506 - This quantitative study does not fulfil the inclusion criteria required for this review, but is associated with this qualitative study.
Aim	To explore the perceptions of participants of this programme, including clinicians, stroke survivors and caregivers
Population	Stroke survivors N=16 A purposive sample of programme attendees during the previous 12 months with a diagnosis of stroke living in/close by London. Inclusion criteria: lived in/close to London and so were able to travel to attend the focus group face-to-face at the National Hospital for Neurology and Neurosurgery, Queen Square, London campus; diagnosis of stroke; and spoke English as their primary language. Exclusion criteria: people with a diagnosis of traumatic brain injury or brain tumour, or severe aphasia preventing full participation in the focus group. Participant characteristics:

	Median age (IQR): 58 (48 to 69.3) years. Female:Male = 8:8. Median months since stroke (IQR) = 19 (12.5 to 30.3) years. Modified Fugl-Meyer upper limb at baseline, median (IQR) = 35 (23 to 43.5), and change at end of programme = 7 (2 to 8). Paretic upper limb left:right = 12:4. Dominant:non-dominant = 7:9. Family support available = 15. Method of programme access: taxi vouchers= 5, hotel accomodation = 10, underground train = 1. Employment status: study = 2, retired = 5, not working = 4, working = 4, volunteering = 1. Caregivers N=2 Two caregivers who attended with stroke survivors who were involved in the programme. Participant characteristics: Female:Male = 1:1. Healthcare professionals N=11 Healthcare professionals including rehabilitation assistants, specialist therapists and highly specialist therapists (including physiotherapists and occupational therapists). Participant characteristics: Female:Male = 10:1. Clinical profession: Occupational therapist = 4, physiotherapist = 5, rehabilitation assistant = 2. Therapist level and average years of clinical practice: highly specialist therapist = 6 (11 years of practice), specialist therapist = 3 (6.3 years of practice), rehabilitation assistant = 2 (1.2 years of practice).

Setting	People living in or around London who were able to travel to attend face-to-face focus groups. 3 focus groups took place for the stroke survivors, while 1 took place for the healthcare professionals. Participants were involved in a previous clinical trial (who had completed the QSUL Programme for 3 weeks plus 6 week and 6 month follow up in the previous 12 months). The QSUL programme provided 90 hours of therapy over 3 weeks, with follow-up in an outpatient clinic at 6 weeks and 6 months post programme completion. Two patients were admitted to the programme each week as day attendees (with 6 on the programme at any one time), either from home or University College London Hospital dedicated patient hotel if they were self-caring or self-caring with the support of one person. Daily intervention consisted of 6 hours of scheduled therapy including two sessions each of one-on-one occupational therapy and physiotherapy focussed on analysis of movement and tasks, reduction of impairment and re-education of motor control within functional tasks. This was supplemented with two sessions of tailored individualised therapy with a rehabilitation assistant targeting repetitive task practice, sensory retraining, adjuncts to therapy such as functional splints, neuromuscular electrical stimulation, robotic devices and group work. Furthermore, people were encouraged to work independently on cardiovascular fitness and were provided with homework to complete each weekend. Education, goal setting and developing self-efficacy for recovered were integral components in the programme.
Study design	Focus groups were performed in a quiet room within the hospital using a semi-structured question guide which included main questions and prompts. The facilitator was independent of the QSUL Programme, and had not been part of any participant therapy or assessment and was not part of managing the clinical team. Their role was to encourage participants to share their personal experiences and opinions as to the key components of the programme (as a stroke survivor, caregiver or clinician) and used probing techniques and prompts to achieve further in-depth reflection. At the end of the focus group, the facilitator rephrased main experiences and meanings expressed to ensure accurate interpretation of participant views. Each focus group was audio-recorded and an additional independent person took field notes during each focus group. The facilitator and field note personnel discussed each focus group at its end to corroborate main discussion points and notes.
Methods and analysis	Verbatim transcription was performed by a professional transcription agency. A conventional thematic content approach was used. Four researchers performed data analysis to avoid any potential bias or personal motivations, promoting confirmability. First, four researchers independently read and became familiar with the complete data set. Second, researchers went through the transcripts line by line to obtain meaningful information and identify repeated topics and patterns. Researchers then interactively discussed interpretation of data to avoid bias in analysis, and integrated data into themes and subthemes. Credibility was enhanced through repeated discussions during the analysis process to 1) clarify interpretation of the data, 2) reframe key themes and subthemes confirming consistency of findings between researchers;

	3) ensure that defined themes accurately reflected the expressions of the participants. Next, quotations and sections of text were extracted under thematic content and checked for consistency with the narrative theme. Finally, on two occasions two researchers re-read all transcripts to confirm that all data fitted into the identified themes and subthemes: post completion of theme development and post manuscript write-up. During the writing stage, further refinement of links and subthemes occurred to ensure consistency of themes. All changes were discussed at each step between the four researchers to achieve consensus. Final transcripts and results of the analysis were not discussed with participants.
Findings	**<u>Stroke survivors</u>** **Psychosocial - 'You feel valued as an individual'** *Individualised goals* Stroke survivors identified that the programme gave them the opportunity to set personalised goals collaboratively with an occupational therapist and physiotherapist, which impacted on their relationships with clinicians and engagement in the programme. Stroke survivors frequently discussed that they were encouraged to set ambitious and challenging goals with nothing considered off limits. Stroke survivors highlighted that while most goals were focussed on their upper limb, they were encouraged to define goals related to their daily routine and/or leisure interests. A broader scope for defining goals meant that stroke survivors had the opportunity to experience the benefits of using their arm and hand more often in everyday situations. *Motivation* Stroke survivors discussed how motivation to persist with the programme was drawn from a variety of sources. This included the enriched rehabilitation environment, variability of activities and incremental task progressed throughout the programme. Additionally, the focus on meaningful real-world tasks was considered important to improve intrinsic motivation, and to maintain interest in working towards upper limb recovery. All stroke survivors discussed the high levels of support received throughout the programme, from both clinicians and fellow stroke survivors who may have had similar problems currently or in the past. The collaborative team focus of the programme, where stroke survivors and clinical staff are working in the same space, provided opportunities for enhanced motivation and self-efficacy; driven by observation-in-

action. The impact of intrinsic motivation on achieved outcomes and recovery was discussed. Stroke survivors described observing some patients on the programme who had a lack of the 'right attitude', which was perceived to hinder recovery and potentially limit derived benefit from the programme.

The structure of the programme along with the follow-up appointments, was described as integral to carry-over into the home environment. Knowing they were coming back for a follow-up appointment was considered to increase drive to continue with therapy after completing the programme.

Values and beliefs

Many of the participants reported feeling quite negative regarding their rehabilitation potential on discharge from previous therapy services or programmes. This created a nihilistic attitude towards recovery, as many patients were led to believe that they could not influence or drive their own progress. The positive attitude of clinicians on the QSUL Programme was described as essential to help each individual acknowledge that they had the potential to improve their recovery, independently participate in the community and ultimately take ownership of their rehabilitation.

Confidence

All of the above subthemes were reported to have an extremely positive effect on the stroke survivors' confidence in their daily routine and activities, creating a sense of autonomy. Participants highlighted that being removed from their home environment, and their habitual routine and supportive families further enhanced their confidence in their own ability to be independent. Those that required use of programme access enablers, for example, using taxis or staying in the hotel, described these to positively influence independence and in turn, confidence. The well organised, positive team approach was considered important for building confidence for success. The opportunity to successfully achieve their goals by practice and repetition of tasks with feedback also contributed to confidence building.

Behavioural training - 'gruelling, yet rewarding'

Pushing the limits

All stroke survivors acknowledged that the programme was exhausting, but the benefits of the intensity were superior. Some stroke survivors reported fatigue at the end of each day. Only one participant reported that it interfere with participation in the programme, which was able to be accommodated within the flexible structure of the programme. All stroke survivors agreed that having a structured timetable while on the programme was useful, giving them something to stick to, even when they may have felt like stopping. They felt the timetabling was tailored to the needs of the individual and was important to maintain a focus on therapy time, providing intensity and repetition of practice with variety.

Critical to being able to push the limits were access to enablers. For example, the close location to the hotel was considered by stroke survivors to minimise fatigue, and enable longer duration of active participation in the intense programme as distance barriers were removed.

Opportunities to learn

Tackling activities that were not able to be performed prior to attending the programme was important to participants. Trialling of new ideas to solve old problems was a unique experience, from which they learnt how to engage in behavioural training and real-world practice. Some participants described that the problem solving skills and knowledge which they learnt on the programme had been carried over to help them solve new tasks when returning home. Many found the holistic approach and integration of physiotherapy and occupational therapy useful to learn new skills for overall recovery.

The opportunity to access gym equipment and aids for activities of daily living provided greater variety, as well as specificity within individual behavioural training. Stroke survivors reported the positive impact of extension of rehabilitation opportunities into the community when linked to their goals, for example, access to pushbikes, local gyms and swimming pools.

Skill set and resources

The stroke survivors stressed the importance of the skillset and expertise of the clinicians on the programme, as well as the collaborative relationships between clinician-patient and physiotherapist-occupational therapist. The importance of integration of all skillsets and communication between all team members when delivering the service was considered to have a marked effect on the success of the programme. The skillset and creativity of the clinicians was considered essential to breakdown goals into achievable components, adapt techniques and adjust treatment modalities to allow goal practice. Stroke survivors perceived that small group sizes and a well-resourced environment was beneficial in supporting clinicians and important in programme success.

Clinicians

Psychosocial

Goal setting

Clinicians highlighted the importance of individualised collaborative goal setting with stroke survivors. Some mentioned the difficulties of setting functional goals when stroke survivors had very little movement and/or had achieved little recovery to date. Within the focus group, clinicians highlighted that they had the time to access a variety of resources as useful tools for developing stroke survivor engagement in their recovery and goal attainment. A strategy described by many clinicians to

support goal-achievement was education about functional task practice or activities rather than impairment-based goals. Previous clinical experience and knowledge of goal setting processes was considered essential.

Confidence and independence

The clinicians acknowledged that some of the gains made by stroke survivors during the programme related to improved confidence; not only in the ability to use their arm in tasks, but also in trying new tasks or skills, and persevering if they were not immediately successful. Clinicians perceived that stroke survivors also became more confident to participate in community tasks, leisure interests and in their ability to look after themselves, enhancing self-worth and identity. In addition, clinicians highlighted the support among the stroke survivors. Each group of stroke survivors became close-knit, encouraging and motivating each other during the programme, aiding the confidence building.

Attitudes and ethos

Clinicians described the burden of high expectations from stroke survivors and programme management to deliver an intense programme with successful outcomes. Clinicians felt the ethos of the programme promoted a very open culture, allowing time and freedom to be creative around therapeutic and behavioural interventions. Many clinicians felt the ethos of the programme promoted a very open culture, allowing time and freedom to be creative around therapeutic and behavioural interventions. Many clinicians felt that anything was permitted on the programme and there were no barriers or rules to be broken. Clinicians acknowledged that there might be a positive bias in terms of the type of patient on the programme, in that stroke survivors had often actively sought referral to the clinic meaning that on the whole they had a drive to improve and willingness to learn. Clinicians also suggested that stroke survivors have to buy into the ethos of the programme, understanding and subscribing into the recovery process in order for it to be effective.

The clinicians highlighted that there was a subset of stroke survivors that required more support and demonstrated increased reliance on the clinicians, with less understanding and buy-in to the self-management aspect of the programme. Clinicians identified that stroke survivors' outcomes from the programme were not just due to intensity of hands-on therapy,

	behavioural training and ability to build on training day after day, but rather the ethos of the programme along with the holistic, integrated approach and multidisciplinary nature of the programme. It was more than just repetitions of movements. **Knowledge and skills** *Skilled, integrated therapy* An important aspect of the programme that enabled smooth running was the skill and level of staffing. It was emphasised that the skillset was integral to implement a structured, yet flexible timetable to meet the varied needs of each stroke survivor. Many clinicians thought it was crucial to have previous neurological rehabilitation experience if you were to be a clinician on the programme, resulting in highly skilled clinical expertise and reasoning. The clinicians understood each discipline's unique skillset and role, which enhanced their ability to work collaboratively. They highlighted the interdisciplinary working and holistic approach and the impact this had on stroke survivor outcomes. Teamwork and open communication were identified as essential to enable clinicians to learn from and support each other, enhancing their own skillset. *Education about stroke recovery* A key component of the programme described was education, both for the stroke survivors and their caregivers. The clinicians identified that a significant amount of time was spent throughout the programme educating stroke survivors about stroke, the upper limb and how to improve. This was done through impairment-based training, retraining quality of movement while performing daily activities and practising goals in real-world environments. Education was also described as useful to overcome barriers to buy-in. Some were described as more difficult to overcome including fatigue, cognitive deficits and negative health beliefs.
Limitations and applicability of evidence	Limitations:

	The study has a small sample size relative to the number of patients that have gone through the programme (n>200), as well as few male clinicians and limited perspectives of caregivers that were able, or chose to be in attendance at focus groups. In addition, the perspectives of managers and decision makers were not captured. Applicability of the evidence: Directly applicable. United Kingdom setting. However, small number of participants and only based around or in London.

Study arms

Stroke survivors (N = 16)
A purposive sample of programme attendees during the previous 12 months with a diagnosis of stroke living in/close by London.

Caregivers (N = 2)
Two caregivers who attended with stroke survivors who were involved in the programme.

Healthcare professionals (N = 11)
Healthcare professionals including rehabilitation assistants, specialist therapists and highly specialist therapists (including physiotherapists and occupational therapists).

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Last, 2021

Bibliographic Reference	Last, N.; Packham, T. L.; Gewurtz, R. E.; Letts, L. J.; Harris, J. E.; Exploring patient perspectives of barriers and facilitators to participating in hospital-based stroke rehabilitation; Disability & Rehabilitation; 2021; 1-10

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
Aim	To explore the perspectives and experiences of patients undergoing hospital-based stroke rehabilitation in order to understand barriers and facilitators to participation in rehabilitation and generate knowledge that could inform clinical practice.
Population	Stroke survivors N=11 Current of recently discharged patients of three recruitment sites with a confirmed diagnosis of stroke. People had to be able to converse in and comprehend English and provide informed consent. People were excluded if they were unable to

	understand questions because of cognitive impairments. The research team had aphasia-friendly documents (consent form, interview guide, visual aids) available if needed, therefore presenting with aphasia did not exclude participants from the study. Five carers/family members were present in four of the interviews. Participant characteristics: Women:men = 4:7. Median age: 60 years. Median time since stroke = 4 months. Two currently in the inpatient unit, 5 on a slow-stream rehabilitation unit, 1 currently enrolled in outpatient rehabilitation, 3 recently discharged from outpatient rehabilitation. The 4 outpatients had completed inpatient rehabilitation.
Setting	Three recruitment sites as part of a regional Integrated Stroke Program. This included: Inpatient stroke rehabilitation - a designated 28-bed specialist stroke rehabilitation unit that admits approximately 325-340 new patients annually. Included an interdisciplinary team of physicians, nurses, occupational therapists, physiotherapists, speech-language pathologists, social workers, dieticians and more to provide goal-directed rehabilitation to people with moderate to severe stroke. Sessions included one-on-one therapy and occasionally additional opportunities for group therapy. People would then be discharged home, to outpatient rehabilitation or a higher level of care. Outpatient rehabilitation - Neuro-rehab program admitting approximately 300 new people annually, with approximately two thirds being patients discharged from the inpatient stroke rehabilitation program. People attended this program 1-3 times per week for an average of 8-10 weeks and worked with occupational therapists, physiotherapists, speech and language pathologists and recreational therapists as required. Restorative care - A 44-bed inpatient unit that admits approximately 190 new patients annually and was intended for people requiring complex care who could benefit from an interdisciplinary, lower intensity but longer duration rehabilitation program. People with severe stroke was admitted. The average length of stay is 45-60 days and the same members of the care team for the inpatient stroke rehabilitation were available.
Study design	Interpretive description methodological approach. An inductive form of qualitative analysis used to generate knowledge of a subjective healthcare experience for the purposes of informing clinical care and research, and draws on methods from both grounded theory and phenomenology.
Methods and analysis	An author and pairs of students conducted 30-60 minute semi-structured interviews at the respective rehabilitation sites. The interviews had no previous relationship with the participants and were trained in qualitative research methodology. Families and informal carers were invited to listen and participate in the interviews at the participants' discretion for the purpose of supporting communication and to provide clarification if necessary. However, all questions were directed to the

	participants. Informed consent was also obtained from family members/carers who were present during interviewing prior to beginning the interview process. An interview guide was developed from clinical knowledge, previous research and key informant interviews with occupational therapists and occupational therapy assistants from each of the three rehabilitation settings. All interviews were audio recorded and transcribed verbatim by an author to allow for increased engagement with the data and greater attentional awareness to the words of participants. Data analysis began at completion of data collection. ID requires the researcher to move beyond formulaic approaches, using iterative reasoning, and making informed decisions aligning with the research question. Here, data was analysed inductively guided by qualitative content analysis. Immersion in the data was extended and sustained throughout the analysis process to enhance the credibility of research findings; to ensure that assigned themes, categories and codes reflected the experience of the participants. The analysis approach was stepwise, beginning with describing the data and leading to conceptualizing and interpreting meaning within the data. Initial coding included highlighting key passages, adding memos and the development and assignment of broad codes. Code definitions were discussed between research team members to establish conceptual consistency before the next cycles of coding began. The transcripts were read several time and assessed each time for the emergency of new codes. As the analytic process continued and our understanding of the data set as a whole evolved, coding became increasingly explicit and codes were refined, condensed and integrated into main themes. After discussing codes, patterns and emerging themes with members of the research team, the final coding scheme was developed, and the main themes and sub-themes were deemed a proper fit for organizing and interpreting the data. As the review of the themes was conducted, links between themes were constructed as part of the interpretive interpretation of findings. Reflexivity was maintained throughout the study process through the critical examination of preconceptions and constant reflection of personal biases, as well as journaling thoughts, feelings, and ideas throughout the analysis process.
Findings	**Overarching conceptual framework: personalised rehabilitation** **Environmental factors** In this study the environmental was defined broadly as the hospital environment in which rehabilitation took place and encompassing the corresponding environments within the rehabilitation setting as well as program resources.

Physical and social environments

The majority of participants commented on the rehabilitation environment and most commonly described aspects of the physical and social environments within the hospital, as well as the program atmosphere, as influencing their participation in rehabilitation. Noise and disruptions in the hospital environment were identified as particular concerns by both patients and their family members. Participants described situations where other patients, visitors, and the daily/nightly hospital activity were disruptive to rest and sleep. Further, this was described as negatively affecting performance in therapy, and the healing and recovery process. Peer interaction among patients was another prominent environmental factors identified by participants. Participants often reflected on their experiences in relation to other patients and described situations of making friends and planning social events, such as going for coffee together. Participants specifically described how these interactions contributed to their progress. Indirect peer interaction, or observing other patients, was also described as influential. It was not uncommon for participants to compare their abilities amongst each other. One admitted using the abilities of others to motivate themselves in therapy.

Family and friends were also described as an important aspect of the social environment. Their role as facilitators for participation in rehabilitation was noted through the encouragement and emotional support they provided as well as their involvement in the patients' rehabilitation processes and their overall presence. One participant described how support from family allowed him to participate in the inpatient rehabilitation program. Program atmosphere was another aspect of the environment perceived to impact the participant experience.

Resources

Availability of resources was discussed in most participant interviews, with the majority of participants referring to ratio of patients to staff/therapist and having to wait for therapy. Many participants noted the low patient-to-therapist ratio as a concern and emphasized how this impacted their efforts to participate in rehabilitation. Other participants further highlighted a lack of therapy and therapy staff on weekends and holidays. Participants expressed frustration because of the impact of this scheduling issue on their progress. Some participants felt the quantity of therapy received as negatively influenced by a

lack of physical resources, which resulted in further delays and wait times and consequently affected participation in rehabilitation.

Components of therapy

Patient-Therapist interactions

Consistently, participants described their relationship with therapists in a positive manner. However, further analysis revealed nuances of how interactions between therapists (and other rehabilitation staff) and patients were perceived and seemed to have a significant impact on how patients engaged in the program. Participants reported they found information shared by their therapists to be infrequent and sometimes unclear. They expressed confusion about what they were being asked to do, why they were being asked to do certain things, and how it would impact their progress. Participants expressed how they wanted the therapists to educate them on the underlying therapeutic value of activities. Another participant described they appreciated how their therapist explained the purpose of the exercises they were performing in relation to performing daily activities, such as putting away groceries. Participants also valued feedback and validation from the therapists, which helped them to improve performance and gauge progress. One participant expressed one of the best parts of his therapy was the validation he received from his therapists. Conversely, participants described feeling discouraged when therapists told them they would likely be unable to progress to the extent they hoped. Participants acknowledged that communication is two-sided and noted the importance of communicating their own healthcare needs and keeping their therapists and other healthcare providers informed.

Amount of therapy

The majority of participants who discussed quantity of therapy during rehabilitation felt they did/were not spending enough time actively participating in therapy activities. Participants perceived they were not getting enough therapy because of limited resources (previously mentioned) or they were not being offered enough opportunities for therapy.

Personalized rehabilitation

Participants described instances where therapy was enhanced when activities were tailored to individual needs, preferences and goals. While some participants perceived therapy to be challenging, others criticized the simplicity of activities. If activities or exercises were perceived to be too easy, there was a risk of becoming bored and losing interest. Another participant made implications of pointlessness when describing therapy activities. Some participants noted that therapy was sufficiently challenging. In addition, therapy activities seemed to be most meaningful to participants when they were developed or refined to match the needs and goals of the individual. One participant talked about how they would collaborate with their therapists to think of new and unique activities for them and how this made therapy enjoyable and made them excited to participate. Personalised rehabilitation through meaningful activity is illustrated by one participant who had a goal of kayaking-was a valued pre-stroke activity and their therapists incorporated it into therapy. People also shared examples of aspects or events that were individually meaningful to them and revealed the impact they had on the patient experience. Some participants described situations specific to the program, such as how family could join in on classes or how being able togo home on weekends added a sense of normalcy to the experience. Another participant expressed how meaningful it was that their pet could visit them on hospital grounds.

Physical and emotional well-being

Tasks such as getting dressed, using a fork, and going to the bathroom/showering were new challenges participants encountered after stroke. While all participants experienced some form of physical deficit, this was not typically described as limiting their participatory efforts. However, post-stroke fatigue was described by some participants as having overwhelming effects on their ambitions to participate. Further, the undercurrent of the emotional impact of having a stroke and all that it entailed was expressed by some participants in the study.

Fatigue

Participants described how being tired and having strength and energy 'taken away' from them made participating in activities a challenge. When questioned about what prevented her from being able to engage in therapy. In addition, participants often appeared astonished by the impact post-stroke fatigue had on their physical capability.

Emotional adjustments

Participants frequently described how physical deficits post stroke created new challenged for them and how these deficits led to difficulties in daily activities and mobility. The process of adapting to these new challenges and living with a changed body appeared to trigger an emotional response. This emotional response appeared to impact desire to participate in rehabilitation for some individuals. Specifically, participants described their stroke as a life-changing event, often resulting in profound loss, leading to feelings of sadness, anger, frustration and depressive symptoms.

Personal motivators

Resuming life roles

Life roles were additional aspects of participants' personal lives that appeared to influence participation. Participants reflected on their roles and appeared eager to resume their 'regular' roles after stroke. Motivation to participate in therapy was seemingly driven by the desire to recover and resume life roles and to alleviate the burden of their stroke on others. One person, however, revealed how their role as son and caregiver impacted their experience participating in rehabilitation with the stress limiting their participation in therapy. Others noted their motivation for participating or 'working hard' was to be able to resume previously valued activities, regain independence and get back to 'normal'.

Attitude towards rehabilitation

	Participants expressed different attitudes towards rehabilitation during the interviews, which appeared to relate to the effort and participation in therapy. The importance of a person's attitude, such as "determination," and effort, were seen as an influential aspect of success in rehabilitation. Determination was contrasted by some participants who felt they were not making progress and made inferences of discouragement and lost hope. Talking about the amount of therapy they were receiving, when asked if they had ever wanted to request more, one participant replied "No, because ... it's gonna do nothing for me. I'm not gonna get nothing out of it ... I don't think it's helping me".
Limitations and applicability of evidence	Limitations: Recruitment of participants relied on clinician referrals working at the respective rehabilitation sites, thus allowing the potential for bias in the selection of patients. It is also important to consider the potential impact the presence of family members may have had on participants' comfort level and willingness to share information with the interviewers. The research examined a small sample within a large urban region and therefore the transferability of the findings requires further investigation using different health care settings, and perhaps larger samples. They did not perform member checks with study participants. Applicability of evidence: Broadly applicable. Canadian based study. Likely applicable to a UK setting.

Study arms

Stroke survivors (N = 11)
Current of recently discharged patients of three recruitment sites with a confirmed diagnosis of stroke. People had to be able to converse in and comprehend English and provide informed consent.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Marklund, 2010

Bibliographic Reference	Marklund, I.; Klassbo, M.; Hedelin, B.; "I got knowledge of myself and my prospects for leading an easier life": Stroke patients' experience of training with lower-limb CIMT; Advances in Physiotherapy; 2010; vol. 12 (no. 3); 134-141

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.
Aim	To describe stroke patients' experience of training with lower-limb constraint induced movement therapy.
Population	Stroke survivors N=7 Stroke survivors who had completed constraint induced movement therapy for the lower extremity; were residing in Sweden; were able to express themselves in Swedish and were not suffering from other serious diseases. People know or treated by the authors were excluded.

	Participant characteristics: Female:Male = 3:4. Mean age (range) = 55 (35-74) years. Affected side (left:right): 4:3. Mean time since stroke event (range) = 6 (1-16) years.
Setting	People were recruited from a rehabilitation department in Sweden where constraint induced movement therapy for the lower extremities is conducted. Constraint induced movement therapy for the lower extremity at this department consisted of intensive training 6 hours/day for 2 weeks, with the unaffected leg restricted with a whole-leg orthosis. Strength training, weight-bearing in different directions, indoor/outdoor walking, stair training and stretching of stiff muscles were included in the programme.
Study design	Data was collected during October and November 2006 using qualitative interviews in the informant's homes, except for one informant where the interview was held at the rehabilitation department. An interview guide was used, containing the overall prompt, "Describe how you experiences the intensive training". Follow-up questions were then asked for more depth and clarification. The interviews took 35-60 minutes, were recorded and then transcribed verbatim by the author (one interview) and by a medical secretary (six interviews). The author had experience of working, for several years, as a physiotherapists with people with neurological diseases and had conducted constrain induced movement therapy both for the upper and lower extremities in people with stroke before the study started. The other authors had minor or no experience of working with people with stroke or constraint induced movement therapy but had used qualitative interviews for research purposes.
Methods and analysis	The data material was processed using qualitative content analysis. The authors met and analysed three interviews jointly, after which one of them analysed the remaining four in the same way with continuous feedback from the other authors throughout the whole process. First, all data was read by all the authors to obtain a sense of the whole. Then meaningful units were extracted and condensed to capture key thoughts or concepts. These meaningful units were labelled and sorted by similarities and differences. The latent content, i.e. the implicit meaning of the text, and the manifest content, what was explicitly expressed, was analysed. Main categories and categories were created from the manifest content of the material and were exhaustive and mutually exclusive. Finally, one theme was formulated that corresponded to the latent content of the texts.

Findings	**Knowledge of myself and my prospects for leading an easier life** The informants stated that lower-limb constraint induced movement therapy, through intensive repetition both in the training and in the information/education, gave them knowledge about themselves and the function of their bodies. This knowledge helped them to live their lives more easily. They felt that there was still hope and possibilities for functional improvements, which gave them increased independence and self-esteem. **The therapy** *Preparation* The preparation for exercise was considered important for all informants. Since lower limb constraint induced movement therapy involved hard and intensive training, it was important to accept this and be prepared for it to be tough. Three of the informants had previous experience of constraint induced movement therapy for the upper extremities and they felt that their earlier experiences were crucial for how they could benefit from lower-limb therapy. The others felt they could have benefited even more from the therapy a second time, when they knew what was required of them. During the preparations, goal and goal images were identified by the participants, as part of the motivation process to give them strength for the intensive training. The preparation was also important for others, as well as for the informants. *The training* The training was experienced as concentrated, intensive and challenging, since each exercise was always at the limit of each individual's ability and capacity. The training was strenuous, but by focusing on the basis of what each individual could manage, and with a clear objective, the informants were able to carry out lower-limb constraint induced movement therapy. Restriction, with the whole leg orthosis, of the "healthy" extremity during the training, compelled the informants to use the weak leg more than formerly. This was an important part of the training, since it had showed them what compensatory patterns they had become accustomed to use. The restriction also clarified for the informants, what function they still had in

the afflicted leg. The training consisted largely of learning new ways of doing things, e.g. learning to walk in a new way, and do things the informants did not believe they would manage. This compelled both body and brain. They experienced a feeling of being "entirely empty-headed" during training, and that the brain "protested".

To carry out constraint induced movement therapy, backup and support at home were needed. The intensive training involved such physical exertion that it was hard to keep up with social activities during the training period. To complete the therapy, it was required that constraint induced movement therapy had the top priority and everything else had to be cut out. During the training, high demands were required in each exercise at high pace, which was experienced as extremely tough. The training was always at the limit of the patients' capacity. The strong group feeling gave the informants the strength to manage one more day. That the training was conducted in an adapted environment, even though in cramped premises, was felt to be stimulating.

Effects

The physical effects were described in various ways: stronger legs, better balance, "I manage more and I use the leg more than before". Training effects were experienced partly during the constraint induced movement therapy period but also later on. The therapy gave a positive experience of being able to trust the leg more and feel like a fully capable person who could walk faster, almost normally, with a new gait technique. Feelings and expressions such as "quite fantastic, overwhelming and a feeling of freedom" that outweighed all the hard work and an experience that the body was recovering faster than the brain, emerged at the same time as the informants became aware of how fragile and exposed their situation was.

Physiotherapists

The informants reported that the physiotherapists and their work was very professional. They had great competence, were sensitive to changes, were at the same time "sharing their lives" and were participating in all activities during the day. The physiotherapists were seen as responsible for control and discipline, by continually modifying the training. They made demands, spurred on, gave positive feedback, encouraged and confirmed; and this made the informants feel that their work

was strenuous. The physiotherapists clearly focused on making every participant better on the basis of his or her own potential.

Me and my body

Motive force

The informant's motivation, persistent, desire to train and the fact that they themselves made the decision to take part, were important aspects for completing constraint induced movement therapy. They felt that they were specially chosen and made the effort since few had the opportunity to undergo this therapy. By making priorities and giving themselves time to work in a goal-oriented way, they managed to complete constraint induced movement therapy.

Changes

The physical effects changed the informants' view of their own capacity and gave a feeling of human worth, of not being finished as a human being. By succeeding their anticipated goals, they strengthened their self-esteem, and their belief in the future was aroused. The knowledge the informants gained about their bodies during constraint induced movement therapy, gave them security in their daily living. Changes also concerned spreading the knowledge and experience they gained. It was important for the informants to be able to report their experience and in this way influence the situation for others with stroke. They also felt that other people experienced them differently after the therapy.

Frustration

The informants felt frustrated by the fact that few know about lower-limb constraint induced movement therapy in the healthcare system in Sweden. They considered constraint induced movement therapy should come early in the

	rehabilitation for everybody affected by stroke. Through reflection over their earlier rehabilitation, the informants felt that the level was too low in traditional rehabilitation and they needed to "raise the bar". They said that "overtraining" was needed. They also wanted an overall programme from the start, since stroke in the acute stage to lifelong rehabilitation, so they can plan their future. In their frustration, there were also disappointments about the focus on managing as well as possible with the help of the "healthy" side in the acute stage of rehabilitation, instead of rehabilitating the "weak" side. Despite knowledge and experience of lower-limb constraint induced movement therapy, the informants felt that they could not manage to train intensively themselves: recurrent periods of lower-limb constraint induced movement therapy were needed. There emerged clearly a frustration that it is not even possible to pay for it privately and a feeling that the council for the healthcare system in Sweden was dragging its heels regarding introduction of new therapy methods.
Limitations and applicability of evidence	Limitations: Not discussed in the study. However, from assessment of the paper, small sample size, selecting people who had completed the therapy (may miss people who could not tolerate it and finished early). Applicability of evidence: Broadly applicable. Swedish setting, but nothing mentioned should be too specific to the setting and the information is likely generalisable to a UK setting.

Study arms

Stroke survivors (N = 7)
Stroke survivors who had completed constraint induced movement therapy for the lower extremity; were residing in Sweden; were able to express themselves in Swedish and were not suffering from other serious diseases. People know or treated by the authors were excluded.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

McGlinchey, 2015

Bibliographic Reference	McGlinchey, M. P.; Davenport, S.; Exploring the decision-making process in the delivery of physiotherapy in a stroke unit; Disability & Rehabilitation; 2015; vol. 37 (no. 14); 1277-84

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	The aim of this study was to explore the decision-making process in the delivery of physiotherapy in a stroke unit.
Population	A purposive sample of seven neuro physiotherapists with experience in acute stroke and stroke rehabilitation and four patients participated in semi-structured interviews. Stroke patients inclusion criteria were; 1) confirmed diagnosis of stroke, 2) aged 18 years and over 3) ability to follow instructions and provide informed consent, 4) be a planned inpatient for at least 4 weeks of the 6 weeks observation period, 5) medically well enough to participate in a physiotherapy treatment programme.

	From this group, three neuro physiotherapists and four patients were involved in observation of practice.
Setting	2 Stroke units in an NHS trust. one acute and one stroke rehabilitation unit - UK
Study design	A focused ethnographical approach involving semi-structured interviews and observations of clinical practice was used.
Methods and analysis	Data were collected through observation of the rehabilitation unit participants and semi structed interviews of all participants. observations occurred of both the physiotherapy sessions and meetings to schedule the physiotherapy sessions. physiotherapist interviews focused on the factors that influenced the planning and delivery of physiotherapy. patient interviews focused on their perceptions of the treatment received . interview guides were used. interviews were tape recorded and transcripts were made of these recordings. Data obtained from the interview transcripts and observational field notes were coded. broader categories were identified from the interviews and field notes. this methodological triangulation of different data sources is important to increase the trustworthiness of the data and revealed a high degree of similarity amongst the categories generated from different data sources. further reflection upon and examination of the final list of categories revealed 3 emerging themes.
Findings	**Planning the ideal physiotherapy delivery** This theme was based on the therapists clinical experience and compliance with organisational practice, as well as the patients clinical presentation and views about physiotherapy. Deciding what the patient required based on perceived need appeared to be more based upon reflections on clinical practice and experience rather than academic research or published literature as there was no literature expressed during any physiotherapist interview. planning physiotherapy occurred during scheduled meetings. prioritisation was used to plan physiotherapy. Patients perceived to be higher priorities were more likely to be seen regularly and for a length of time and time of day relating to achieving their goals. Lower priority patients were seen for less time and less frequently. high priority patients included; newly admitted patients,

	patients demonstrating potential to rehabilitate, patients who are complaint and motivated, patients who missed out on therapy the previous day, patients at risk of deteriorating, patients requiring imminent discharge. **The reality of physiotherapy delivery** This reality was influenced by staffing availability, non-clinical commitments, organisational factors and the patient's response to therapy. available staffing was a major influence and resulted in patients being seen less frequently and for a shorter time. patients did not report dissatisfaction when their planned session did not occur as they understood this was due to reduced staffing. Staff meetings, in-service training and ward handovers also reduced the amount of time available for treatment sessions. delays in multi-disciplinary involvement also impacted upon the provision of physiotherapy. For example patients not being washed and dressed at the time of their scheduled therapy therefore they would try and see another patient in the vacant slot. **Involvement in the decision making process** Dependent on the situation there were varying levels of patient involvement in the decision-making process to delivery physiotherapy. this was often dependant on the patients ability to interact with the physiotherapist. this collaborative approach was evident during observations. when patients were visibly tired, patients were often asked if they wanted to stop the session. in all interview's and observations the patients request for preferred time of day was taken into consideration when therapy was delivered. Deciding the frequency of sessions was the only element of physiotherapy delivery where physios did not involve the patient. this was determined by available time and perceived need.
Limitations and applicability of evidence	One important consideration regarding this study was the influence of the researcher being a line manager to some of the physiotherapist participants. There findings from observed sessions may not be truly representative of the reality of physiotherapy delivery. However, as the researcher and physiotherapists regularly performed joint therapy sessions and observed sessions this phenomenon may not have been as apparent as expected, another limitation related to the small number of participants all recruited from one stroke service, which may not be representative to other stroke units. A final limitation was the limited time spent with study participants. this was limited to 6 weeks due to the researchers pre-existing clinical commitments.

Study arms

the decision-making process in the delivery of physiotherapy (N = 11)

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Merlo, 2013

Bibliographic Reference	Merlo, A. R.; Goodman, A.; McClenaghan, B. A.; Fritz, S. L.; Participants' perspectives on the feasibility of a novel, intensive, task-specific intervention for individuals with chronic stroke: a qualitative analysis; Physical Therapy; 2013; vol. 93 (no. 2); 147-57

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR

Aim	The purpose of this study was to assess the feasibility of a novel, intensive, task-specific intervention from the patient's perspective
Population	Inclusion criteria for the IMT study were: greater than 6 months post stroke, the ability to stand for minutes with or without an assistive device, the ability to walk with or without an assistive device for a minimum of 9.7 m (10 ft), and the ability to transfer (ie, from a wheelchair to a bed) with minimal assistance. Exclusion criteria for the IMT study were: the presence or diagnosis of other neurological conditions, the presence of nonhealing ulcers, resting blood pressure greater than 180/ 100, and various medical conditions that might place an individual at increased risk or harm.
Setting	USA - stroke rehabilitation centre
Study design	A phenomenological approach to qualitative inquiry was used.
Methods and analysis	Intensive mobility training was performed 3 hours per day for 10 consecutive weekdays, for a total of 30 hours. During each session, 1 hour was dedicated to gait training. For the purpose of the larger intervention trial, participants were randomized to either body-weight– supported treadmill training or traditional overground gait training. The remaining 2 hours of therapy was dedicated to balance (1 hour) and strength, range of motion (ROM), and coordination (1 hour) activities. Rest time was limited to a maximum of 30 minutes during the 3 hours of therapy. Data collection methods involved 2 semistructured interviews and a focus group. Semistructured interviews were held with each participant after the initial 5 days of participation and following completion of the 10 days of therapy. A series of open-ended questions were asked regarding their impressions and physical tolerance of the therapy. Past and present participants of the larger clinical trial, as well as their caregivers or family members, were invited to attend a focus group in an effort to obtain collaborative thoughts on the feasibility of the therapy. This focus group included both participants who completed the semistructured interviews and those who did not. Individuals with moderate to severe aphasia were not included in the focus group due to the nature of the research (interview). Focus group questions were pulled from the semistructured interviews and specifically addressed identical concepts of individual perceptions and physical tolerance of the therapy. The duration of the focus group was 30 minutes. The focus group was conducted by the primary researcher and recorded using a digital voice recorder.

	All interviews were transcribed verbatim into text format by the primary researcher. The data were analyzed with an interpretive thematic analytical approach using qualitative analysis software (NVivo 8). Reduction of the data involved repeatedly reviewing the data in an effort to organize, manage, and extrapolate the most meaningful sections of the data. Sections of data that provided insight on the feasibility of the therapy were highlighted. The final stage consisted of conclusion drawing and verification. Here the coded text and emerging themes from the data must be assessed for their credibility through the solicitation of a peer review to ensure that participant's perceptions are fully and accurately represented.
Findings	**Fatigue** Fatigue was the theme most discussed by participants. References related to fatigue included experiences such as the fatigue experienced during the therapy, as well as fatigue carried over to the home environment. A common perception was that some days of therapy were very difficult and others were not. Participants discussed going home and having to nap or rest on some days, and other days being able to go about their daily routine. **Intensity** Participants made various statements regarding the intensity of the therapy and how they felt their bodies handled the intense nature of the intervention. The majority of comments revolved around the therapy being difficult, yet doable. Frequently, participants made comments regarding their perception of the intensity after initiation of the therapy and how their perception changed by the end. Harold commented, "At first, I thought the length was too long, 3 hours . . . but by the end, I thought it was fine." Other participants discussed how they questioned their physical ability to complete the therapy, but were surprised by what they were able to accomplish. One participant did suggest the therapy time be reduced. **Short therapy duration**

	A common theme among participants was that the therapy duration (10 days) was too short. Participants frequently commented on how the therapy ended just as their body adjusted to the intensity. The short duration also seemed to lead to personal frustration that something that was helping them was taken away. **Enjoyment of therapy** Despite the intensity and the associated fatigue of the therapy, participants frequently commented on their level of satisfaction and enjoyment of the therapeutic experience. Many participants commented on how this therapy has been different from what they have experienced in the past. **Muscle soreness** Participants commented on using muscles they have not used in a long time and reaching a point of muscle soreness. No statements were made regarding an intolerable level of muscle soreness or severe discomfort.
Limitations and applicability of evidence	This study presents some limitations; therefore, the application of findings to similar situations and populations should occur with some consideration. As with all qualitative research, the results of this study have limited generalizability. Instead, sampling methods were incorporated to achieve representativeness with the aim of increasing the transferability or applicability of the findings to similar populations, situations, and questions.25 Although the number of participants was small (standard for a phenomenological approach), data saturation was found, and further recruitment of participants was not necessary. As with most qualitative research, there was the potential for researcher bias, as the researcher is the one conducting the interviews and analyzing the data. In this study, multiple steps were taken to ensure the trustworthiness of the data and limit researcher bias. Lastly, there remains the possibility that participants were not comfortable reporting negative comments to the researcher (interviewer) due to the researcher's involvement in intervention implementation.

Study arms

feasibility of a novel, intensive, task-specific intervention (N = 8)
Eight individuals with chronic stroke participated in an intensive intervention, 3 hours per day for 10 consecutive days. Participants were interviewed twice regarding their impressions of the therapy, and a focus group was conducted with participants and family members

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Merriman, 2020

Bibliographic Reference	Merriman, N. A.; Bruen, C.; Gorman, A.; Horgan, F.; Williams, D. J.; Pender, N.; Byrne, E.; Hickey, A.; "I'm just not a Sudoku person": analysis of stroke survivor, carer, and healthcare professional perspectives for the design of a cognitive rehabilitation intervention; Disability & Rehabilitation; 2020; vol. 42 (no. 23); 3359-3369

Study details

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

Other publications associated with this study included in review	NR
Aim	This qualitative study examined the perspectives and preferences of stroke survivors, carers, and healthcare professionals to inform the design of a cognitive rehabilitation intervention
Population	those eligible for inclusion were people who reported experiencing cognitive impairment as a consequence of a stroke, or who were central to providing rehabilitation or care for people with cognitive impairment after a stroke. patients had to be >18 years of age, possess a sufficient level of English to have the capacity to communicate and participate in interview and indicate their willingness to participate. in addition the stroke survivor had to be living within a community setting and not in residential care.
Setting	UK based community setting in the republic of Ireland
Study design	Descriptive qualitative study design involving in-depth semi-structured interviews.
Methods and analysis	In depth interviews were conducted and followed a semi structed topic guide broadly addressing; 1) experience of stroke and cognitive impairment, 2) experience of post stroke rehabilitation, 3) experience of interventions to improve cognitive impairment and 4) recommendations for development of an intervention to rehabilitate cognitive impairment after stroke. interviews took place over a 6 month period and were held in a location convenient for participants. interviews lasted between 19 and 121 minutes, were recorded using a digital audio recorder after which they were transcribed verbatim. transcriptions were imported into NVivo 12. Transcripts were thematically analysed to identify patterns or themes in the date. inductively-derived themes were reorganised based on deductive thematic template. stroke survivors, carers and healthcare providers data were analysed as three separate groups with results synthesised and compared.
Findings	**What activities to include**

	Be meaningful to patients The perceived value and utility of cognitive exercises varied among stroke survivors and carers, with perceptions shaped by preference as well as ability. health care professionals recognised that while it was important to include evidence based exercises, this had to be balance with the interests of the patients and these should be tailored to their individual abilities and goals. inclusion of home activities was considered as necessary by most interviewees. **Appropriate to patient capacity** Stroke survivors described how mood, functioning and fatigue levels differed on a daily basis and impacted on their ability to engage in rehabilitation. **Information education and communication** Stroke survivors noted that lack of information and poor communication had contributed to their sense of frustration, self-doubt and loss of confidence. The period post discharge was the one which significantly lacked support. **When will it take place** **Period post-stroke** Sake holder perspectives varied regarding when stroke survivors should begin cognitive rehabilitation and the duration and frequency of rehabilitation sessions. issues of capacity, fatigue and concentration featured in interviews. a commonly articulated view was that the further the person is into recovery the more likely they will be able to engage in activities for longer and more intense periods of time.

duration and frequency

Variation on the intervention duration ranged from a set period of 4 weeks to 10 weeks with some adding that a step down approach should be adopted when the intervention comes to an end. Some stroke survivors recalled how their concentration would diminish and that fatigue would set in after 20 minutes and so believed they would be unable to engage in sessions longer than this. For others a 2 hour session one a week was considered feasible. some healthcare professionals added that more intense, short and frequent sessions should ideally take place based on the assumption that intensity and repetition in an acute setting can lead to better outcomes.

Where will it take place

there was consensus that the rehabilitation should be delivered at a location that was accessible and within the local community. Suggestions included local community centres, hospitals and outpatient clinics.

Off-site service and support

health care professionals commonly stressed the importance of off site services provided in the home setting as being necessary - this was particularly stressed by OTs. stroke survivors spoke positively about their experience of having someone visit them in their home. Agreement on the value of someone contacting them between sessions was shared among stroke survivors.

How will it be delivered
stroke survivors were largely supportive of being involved in group-based activities, noting the social aspect of group work, including opportunities for social interaction and shred experiences and coping strategies. Carers expressed some reservation about group activities citing issues such as noise and lacking confidence to speak out. group based activities

	were described as being particularly used for education, general cognitive stimulation and social interaction. interviewees suggested that individual cognitive impairment levels determine the utility of group activities, suggesting that group activities would only be useful where people have good awareness if their deficits, have sufficient ability to maintain attention and concentration and where major mood or behaviour issues are not present. **Who to involve** **Healthcare professionals** stroke survivors and carers spoke positively about individual healthcare professionals with whom they had interacted, although they were critical if service availability and support. Carers expressed that their loved ones care could be improved if they were consistency seen by the same healthcare professional who was familiar with the stroke survivor and their condition. similar issues were reflected in healthcare professionals descriptions of the current challenges of delivering adequate rehabilitation in the face of limited staffing, limited competency or experience with cognitive problems and limited access to psychological services. in the absence of dedicated psychologists OTs were most frequently suggests as being the best placed to deliver cognitive rehabilitation. **Carers** in addition to trained staff, involvement of carers in a cognitive rehabilitation programme was considered important by all interviewees. Involving carers was also described as being important for passing on information and skills so that carers can support stroke survivors between rehabilitation sessions to work on their goals.
Limitations and applicability of evidence	the study was conducted with people from different regions of the republic of Ireland; therefore the results may nit capture experience in other countries, and may not be generalisable to other interventions. Give the small nature of participant selections the participants may not be representative of all stroke survivors.

Study arms

perspectives for the design of a cognitive rehabilitation (N = 44)
In-depth semi-structured interviews were conducted with stroke survivors (n = 14), carers (n = 11), and healthcare professionals involved in providing stroke care (n = 19)

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Mohd Nordin, 2014

Bibliographic Reference	Mohd Nordin, Nor Azlin; Aziz, Noor Azah Abd; Abdul Aziz, Aznida Firzah; Ajit Singh, Devinder Kaur; Omar Othman, Nor Aishah; Sulong, Saperi; Aljunid, Syed Mohamed; Exploring views on long term rehabilitation for people with stroke in a developing country: findings from focus group discussions; BMC Health Services Research; 2014; vol. 14 (no. 1); 118-118

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with	NR

this study included in review	
Aim	The aims of this study were to explore perceptions of long term rehabilitation among rehabilitation professionals and people with stroke, and identify strategies for the provision of such services.
Population	focus group 1 consisted of rehabilitation professionals. Managers were asked to nominate a rehabilitation physician, a physiotherapist, an occupational therapist, a speech pathologist and a medical social officer who were currently members of a multidisciplinary stroke rehabilitation team and have had more than five years of experience in stroke care. Assistance from the managers of the rehabilitation department of the hospitals were sought in selecting the professionals as study participants considering that they would better know their staffs' experience and ability to participate in a discussion. Rehabilitation professionals working on a part-time or a rotation basis, who had less than three years of experience in managing stroke patients were excluded. Participants for FG2 were selected from a pool of stroke survivors who had attended rehabilitation intervention in the Rehabilitation Department of UKMMC. None of the researchers were involved in the care of stroke patients at the department, thus the list of the survivors was obtained from a physiotherapist who was in-charged of stroke rehabilitation services at the department. Included participants were those who had had a stroke one or more years prior to enrolment. Stroke severity was also used as a selection criterion in order to gather data from a range of different perspectives; participants were selected from three categories of stroke severity: mild, moderate and severe. Stroke patients who were known to have severe depression (assessed with the use of the Hospital Depression Index), poor cognitive function as measured with the Mini Mental State Examination (<24), speech and language difficulties as determined by a speech pathologist who assess the patients with a standardised assessment procedure and unstable medical conditions such as unstable angina, which affect engagement in exercise programmes, were excluded
Setting	This study was conducted at two university-based health institutions: Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and the United Nations University International Institute for Global Health both located in the city of Kuala Lumpur, Malaysia.
Study design	This qualitative study utilised focus group discussion in an attempt to understand how long term rehabilitation is perceived by rehabilitation professionals and individuals with stroke. Focus groups were used because they provide an opportunity for in-depth discussion between participants with similar and diverging views; therefore, the resulting supportive and argumentative dynamics add to the richness of the dataset.

Methods and analysis	Each group met on two occasions which occurred at one-month intervals. Prior to each session, a topic guide was developed based on literature review and consensus, which included questions relating to satisfaction of current rehabilitation services, beliefs toward long term rehabilitation, and possible approaches for long term rehabilitation services. The groups were moderated by the main researcher, who has experience in stroke rehabilitation and was facilitated by a stroke rehabilitation consultant and a research assistant. The moderator encouraged interactions among the participants and ensured that each group fully discussed each study topic and that each participant had an adequate opportunity to express his or her views. All discussions lasted between 90 and 120 minutes and were audio taped. The key issues discussed during the first meeting session were fed back to participants at the beginning of the second meeting to enable respondent validation of emerging themes. The second meeting also served as a platform for further discussions on topics that were not fully addressed during the first meeting, in the researchers' attempt to ensure data saturation. All data were analysed using a thematic analysis approach. Audio tapes were first transcribed and the transcripts were reviewed for accuracy. Themes were identified by the two researchers by constantly reading and re-reading the transcripts. Interpretations made by the two researchers were then compared and discussed until reaching an agreement.
Findings	**The needs for continuity of care** The majority of participants in FG1 and FG2 agreed that stroke rehabilitation services in the country had improved over the current decade. However, they felt that enhancement of the continuity of care for stroke patients, following hospital discharge was needed. Participants also perceived a lack of support system as a main obstacle to continued care. **Beliefs about long term rehabilitation** Most of the participants believed that further rehabilitation for stroke patients was useful provided that the stroke patients are motivated to continue with the therapy. Nonetheless, a few participants from the rehabilitation professionals group were sceptical about the benefits of continued of rehabilitation for chronic stroke patients. On the contrary, all of the participants in FG2 had positive beliefs about long term rehabilitation. They claimed that they have no problems continuing 'exercises' in a longer amount of time post-stroke and viewed long term 'exercises' as important to maintaining strength.

Uncertainties about the definition and goals of long term stroke rehabilitation

A participant from the rehabilitation professionals group emphasised a need to clearly define ‘long term stroke’ to assist in achieving the targeted outcomes and plan rehabilitation for long term stroke patients.

Resource limitation

All participants viewed limited resources in the current healthcare system as a major barrier to the provision of long term rehabilitation to people with stroke. Inadequate or ill-equipped stroke rehabilitation wards may be a reason for some patients missing out on rehabilitation after being discharged from acute care in medical or neurology wards. There were also very limited community based rehabilitation (CBR) centres for stroke in this country, which served as a transfer of care destination for patients following hospital-based rehabilitation.

Shortage of manpower

Staff shortages requiring workers to care for too many patients at once had affected the staffs’ amount of contact time with their patients. They claimed that caring for stroke patients for an extended period for long term rehabilitation would only make this situation worse. Understaffing was also viewed as a main reason for long waiting times, which may have led to poor compliance among stroke patients in attending hospital care and rehabilitation.

Scarcity of hospital transport services and parking spaces

The issue of poor mobility services was also raised. Living far away from hospital has caused patients with low socioeconomic status to not be able to pay for public transport to attend rehabilitation for an extended period of time.

Low awareness among patients and their families regarding optimum rehabilitation

The lack of awareness of the importance of optimum rehabilitation among patients and their families was seen to result in poor compliance to rehabilitation. This was attributed mainly to lack of patient education offered by highly occupied rehabilitation staff.

Poor motivation among stroke survivors

The issue of motivation to participate in continuous therapy also emerged in the discussion among the participants in FG2. Two participants who have had severe stroke claimed that their motivation level declined as the stroke became chronic hence were not motivated to continue practicing the previously learnt exercises at home.

Approaches to long term rehabilitation

Establishing community-based stroke rehabilitation

Participants in both FGs agreed that community-based rehabilitation centres are greatly needed to manage long term stroke patients.

Addressing the issue of manpower shortages

Some of the participants stressed the need to ensure adequate number of physicians and therapists in community-based rehabilitation centres if they were to be established, due to the nature of CBR being multidisciplinary. Creating therapy or rehabilitation assistant positions may be a temporary measure to overcome the issue of the lack of therapists.

	Optimising family in continuing therapy at home Another potential approach to increase the continuity of rehabilitation, which was viewed as useful by most participants in FG1, was to involve the family members in conducting basic therapy at home. Although family-assisted therapy was seen as one possible approach to continuity of rehabilitation, the commitment of family members was questionable. The majority of participants felt that the family of stroke patients had not given adequate support throughout the rehabilitation process, especially in the later stage of stroke recovery.
Limitations and applicability of evidence	Although recruitment of participants was carefully attempted based on the individual's ability to express their ideas, some participants did not engage adequately in the discussions. Several participants in both FGDs had to be encouraged to express their opinion. This has interrupted the natural flow of the discussions and threatened the richness of the data. This would also imply that the two focus groups with a total number of four discussion sessions may not be adequate in ensuring saturation of data. A larger number of focus groups and recruitment of new participants for both the rehabilitation professional and the stroke survivors groups would be required to sufficiently explore this topic. There were also issues related to low voice volume in some participants, resulting in difficulty in transcribing and interpreting the audiotaped data. Field notes taken during each discussion session has somewhat been useful to compliment data obtained from the recorded conversation. Study is based in a developing country so not directly applicable to NHS UK setting.

Study arms

professionals and patients views on long term rehabilitation (N = 23)
Focus group discussions were conducted involving 15 rehabilitation professionals and eight long term stroke survivors

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Morris, 2007

Bibliographic Reference	Morris, R.; Payne, O.; Lambert, A.; Patient, carer and staff experience of a hospital-based stroke service; International Journal for Quality in Health Care; 2007; vol. 19 (no. 2); 105-12

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	the aim is to study the experiences of patients, carers and staff throughout a hospital stroke care pathway
Population	A list of 80 discharges from stroke rehabilitation over 3 months was obtained. Exclusion criteria were severe communication difficulty, severe cognitive impairment or no carer. The remaining 54 carers and patients all received a letter about the study and were telephoned until 11 patients (maximum group size) and 6 carers agreed to participate at the arranged time. Lists of members of staff in the stroke service were obtained and three groups formed: one group of therapists, a separate group of nurses (qualified nurses and health-care assistants) and medical staff from rehabilitation, and a single group covering as many professions as possible from the acute ward. Senior staff, managers and medical consultants were not included in

	these groups, since team members indicated this would inhibit discussion. Members of staff were contacted to obtain provisional consent, going down lists until each group was full (11 members) or the end of the list
Setting	specialist hospital stroke service. UK The focus of the study was the National Health Service provision for stroke in a major city. It consisted of a 26-bed acute stroke unit, and, on a separate site, two adjacent 24-bed stroke rehabilitation wards. Each unit had a multidisciplinary team with all the relevant professions
Study design	Focus groups of patients, carers and staff followed a semi-structured format to elucidate experiences. The groups were recorded, transcribed and subjected to thematic analysis. Analyses were verified by researchers and participants.
Methods and analysis	The two group facilitators were graduate psychologists with no previous experience of the service. They received training in focus groups from an experienced researcher. Recordings were made and transcribed. All groups lasted for 1.5 h and followed a semi-structured format. A demographic questionnaire was given at the outset. Patient and carer groups: The interview questions followed a chronological sequence from the stroke to discharge. Staff groups Questions included the nature of the service, strengths, weaknesses, shortfalls, possible improvements and helpful and difficult factors. Transcripts were read and salient items and issues were noted and sorted into groups. Each group was examined to produce a preliminary label and definition of the theme. Transcripts were then re-examined for further material relevant to each theme. Themes were considered to determine whether they were hierarchically related, but no hierarchy emerged. Two analysts (the facilitators of the focus groups) conducted this analysis independently and discussed their results to reach an agreement. The results were then discussed with members of the original groups, theme by theme, for verification. Finally, the two facilitators and the principal researcher examined the themes across all three groups for overlap; this resulted in combining four of the patient and carer themes

Findings	**Patients and carers' themes** Information. Information provision was widely discussed by patients and carers, and experiences varied; some received excellent information, whereas others felt it was inadequate Staff attitudes. Patients and carers made numerous comments about the high level of commitment of staff. However, the patient group believed that a small minority of nurses or healthcare assistants was poorly motivated. Availability of care/treatment. The availability of staff to provide care and treatment was discussed at length by both groups, particularly the availability of nursing/care staff. Toileting was identified as a particular problem. Finally, they believed more therapy was required, and lack of therapy was thought to be related to setbacks in the recovery process. Considering the whole person in context. Patients and carers felt that broader human needs were not met and that care was overly narrow and focussed on physical care. Many participants commented on the lack of stimulation and its impact on moral.

	Accommodation of patients' individual needs. The carer group believed that patients' care was often too standardized and not delivered in a way that met their individual needs. Burden of care. Carers felt they needed to compensate for the perceived shortfalls in the care of their relatives by providing it themselves. In some cases, this extended to the care of other patients. **Staff groups' theme** Specialist service. All three staff groups described ways in which the dedicated stroke service and care pathway were key strengths. Staff develop expertise in stroke care, which benefits patients and carers through the provision of tailored input. Split service. Where there were physical or professional separations in the service, problems occurred. Staff morale. All staff groups described a sense of powerlessness. Nursing staff related this to staffing shortages and lack of opportunity to use all their skills. The therapists felt that their skills and knowledge were not recognized and decisions were not collective.

	Wish for change: recommendations. Recommendations for change were made: better selection of appropriate stroke patients for the wards, a daily multi-professional ward round to improve communication, more mixing of staff between units, improved consistency of care, better staff training opportunities, better considerations of patients' individual needs, especially 'hidden' needs such as cognitive disabilities, and better nursing staff ratios. Some staff felt that external mediation might be necessary to bring change.
Limitations and applicability of evidence	The current study suffered from a number of limitations. In common with many health services, there were few males to participate. There were no independent measures of process or 'objective' outcome measures against which to assess the technical quality and efficacy of the care provided. Patient and carer group members were necessarily a self-selected group, and none had been discharged straight from the acute unit. Patients with severe communication or cognitive problems or without carers were not included. The most senior staff in the service, the medical consultants, managers and the stroke co-ordinator were not able to participate, despite being supportive of the study. Staff felt this allowed them to feel less inhibited in discussion of sensitive issues, but their absence may have impeded discussion of the wider context of the service and the influence of clinical and policy guidelines. Very applicable due to UK setting but slightly outdated

Study arms

experience of a hospital-based stroke service (N = 34)
Focus groups of patients, carers and staff followed a semi-structured format to elucidate experiences.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Moss, 2021

Bibliographic Reference	Moss, B.; Northcott, S.; Behn, N.; Monnelly, K.; Marshall, J.; Thomas, S.; Simpson, A.; Goldsmith, K.; McVicker, S.; Flood, C.; Hilari, K.; 'Emotion is of the essence. ... Number one priority': A nested qualitative study exploring psychosocial adjustment to stroke and aphasia; International Journal of Language & Communication Disorders; 2021; vol. 56 (no. 3); 594-608

Study details

Secondary publication of another included study- see primary study for details	This qualitative study was nested within the Supporting well-being through PEeR Befriending (SUPERB) study (ClinicalTrials.gov identifier NCT02947776)
Other publications associated with this study included in review	NR
Aim	What promotes or hinders adjustment specifically in people with aphasia and their significant others in early recovery, exploring both their internal resources and external sources of care and support
Population	Inclusion criteria for participants were aged >18 years; fluent premorbid users of English (confirmed by relative or self-report); presence of aphasia due to most recent stroke; and low levels of emotional distress (score ≤ 2 on the Depression Intensity Scale Circles) (TurnerStokes et al. 2005). Each participant was invited to nominate one significant other, who was their closest confidant and > 18 years old. If participants lived alone, their significant other had to be some.

	Participants with aphasia were 10 women and 10 men; their median (interquartile range— IQR) age was 70 (57.5–77.0) years. Twelve participants had mild aphasia, eight moderate–severe aphasia. Significant others were six women and four men with a median (IQR) age of 70.5 (43–79) years. Exclusion criteria for participants and significant others, confirmed by medical notes or self/significant other report, were other diagnoses affecting cognition or mental health; severe uncorrected visual or hearing problems; or severe or potentially terminal comorbidities, on grounds of frailty. Participants were also excluded if they were discharged to a different geographical location from the recruiting hospital borough.
Setting	community based - UK
Study design	This qualitative study was nested within the SUpporting well-being through PEeR Befriending (SUPERB) study. SUPERB was a single-blind, mixed-methods, parallel group feasibility (phase II) randomized controlled trial (RCT) comparing usual care (USUAL) with usual care plus peer-befriending (PEER) for people with aphasia post-stroke who had low levels of psychological distress.
Methods and analysis	The qualitative study used semi-structured interviews with a subsample of participants (n = 20) and significant others (n = 10) from both arms of the trial at 4 months post-randomization to explore the acceptability of trial procedures, experiences of care and the process of adjusting to life with aphasia after stroke. Interview topic guides were created by a senior qualitative researcher and refined through discussion with a user group of people with aphasia. Face-to-face interviews took place in participants' homes and were audio- and video-recorded with written consent. A research assistant (KM), a speech and language therapist with extensive experience of communicating with people with aphasia, conducted the semi-structured interviews. She was trained by a senior qualitative researcher (SN) who had extensive experience of adapting qualitative methodologies for people with aphasia. The senior qualitative researcher viewed two videotaped initial interviews and gave feedback to ensure questioning was unbiased and led to a full exploration of topics. All interviews with participants were transcribed. Data were analysed using framework analysis (Ritchie and Lewis 2003), a type of thematic analysis. Initial themes and concepts were identified through reviewing the data. These were then used to construct a thematic index and assign an index label to each phrase or passage of the transcripts. The labelled raw data were summarized and synthesized into the

	thematic charts. This matrix-based method of analysis facilitates systematic exploration of the range of views, both between and within cases, to produce both descriptive and explanatory accounts of the data.
Findings	**Hospital and rehabilitation** A prevalent theme was feeling well cared for by individual doctors, nurses and other hospital staff. There was a sense they received emotional as well as physical care (‘everything to comfort me’; Ivy); were responded to as individuals, for example, using humour; and treated with friendliness and kindness. Despite positivity towards individual health professionals, issues were raised relating to life on the ward. Rapport was an important factor in how participants experienced therapy and its providers. Personalized therapy and goal-setting were seen as motivating, as were positivity and encouragement. Negative reports related to lack of, or limited, therapy; several participants would have liked a more intensive regime. For example, Sayid, who had very little speech, was discharged from speech and language therapy without explanation after only three sessions **Life changes since stroke** Participants described a new sense of vulnerability, loss of confidence and reduced independence, which lowered their mood. Several articulated that having a stroke had made them more aware of their mortality and left them feeling shocked. Diminished confidence was sometimes associated with social withdrawal. Frustration or anxiety regarding recovery progress, and uncertainty over how much improvement they could expect, was a concern for a subset of participants who felt their prognosis had not been adequately discussed. Identity/sense of self Participants commonly described identity changes and an altered sense of self post-stroke. Some changes were negative such as no longer feeling ‘charming’ (Ivy), or feeling vulnerable. A particular concern from significant others appeared to be participants’ reduced independence, and resultant distress. They also described participants’ increased lethargy and lowered self-esteem. Many significant others described the burden of caring. Despite the detrimental impacts of caregiving, significant others spoke of positive consequences of the stroke, such as strengthened bonds, pride in participants’ courage and relief that they had survived. **Personal resources**

	Resilience, determination and optimism were frequently reported to impact adjustment. For a subset of participants, faith was highly important, helping them feel grateful, calm and resilient, and to cope with and adjust to life's ebb and flow. Setting and moving toward targets despite setbacks was key to adjustment and maintaining a positive outlook for some participants. Participants described setting short-term tasks immediately post-onset, such as completing a word puzzle, and more long-term incentives to recovery, such as pre-booking a theatre ticket. Some said their confidence in achieving goals had increased rather than diminished. A subset of participants described undertaking activities they felt would benefit their recovery, such as walking around the hospital corridors to aid stamina, martial arts for balance, buying an exercise bike and handwriting practice to help with aphasia. **External sources of help and support** Participants were overwhelmingly positive about the central role of family in their recovery after stroke. Family members also provided practical support. Participants described how family members had prioritized looking after them, sometimes reorganizing their own lives. For many, both family and friends appeared vital for remaining connected to 'normality' and settling back into realities of their pre-stroke lives, such as discussing current affairs and politics. Participants described receiving informal psychological support from family, stroke groups, peer-befrienders and other ward patients. The majority of participants spoke about attending community stroke groups, and opinions of these varied. Reasons for choosing not to attend included preferring to manage problems ; avoiding others who 'reminded' them of their condition; finding others' experiences distressing or irrelevant; not liking just talking. Others valued the 'lovely atmosphere', enjoying the companionship groups provided. These participants appreciated the sense of being part of a wider community with similar experiences, and felt they benefitted from seeing that they were on a spectrum of stroke effects. Many participants had lived in the same tightknit communities for many years, and valued the social activities offered by their clubs, political parties and faith groups. They also described becoming 'more choosy' about where they went and with whom, due to fatigue and reduced mobility.
Limitations and applicability of evidence	There were also limitations. Participants were selected from a wider group of individuals who had already consented to participating in the SUPERB trial. The small number of significant others interviewed may have meant that data saturation was not reached for this group. It could also be argued that paired significant others and participants with aphasia should both have been interviewed. Owing to their aphasia, transcripts were not returned to participants for their approval, nor was their feedback sought. Finally, the study was based in London, UK, and it is possible the findings may not reflect issues from other settings or cultures.

Study arms

peer-befriending for post stroke aphasia (N = 30)
Participants with aphasia were 10 women and 10 men; their median (interquartile range—IQR) age was 70 (57.5–77.0) years. Twelve participants had mild aphasia, eight moderate–severe aphasia. Significant others were six women and four men with a median (IQR) age of 70.5 (43–79) years. They identified a range of factors that influenced adjustment to aphasia post-stroke.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Nguyen, 2019

Bibliographic Reference	Nguyen, Ai-Vi; Ong, Yau-Lok Austin; Luo, Cindy Xin; Thuraisingam, Thiviya; Rubino, Michael; Levin, Mindy F.; Kaizer, Franceen; Archambault, Philippe S.; Virtual reality exergaming as adjunctive therapy in a sub-acute stroke rehabilitation setting: facilitators and barriers; Disability & Rehabilitation: Assistive Technology; 2019; vol. 14 (no. 4); 317-324

Study details

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

Other publications associated with this study included in review	NR
Aim	To identify the facilitators and barriers perceived by clinicians to using an Exergaming Room as adjunct to conventional therapy.
Population	Ten clinicians (four physical therapists, six occupational therapists) from the Stroke Program at the Jewish Rehabilitation Hospital (nine female, one male, age range 25–50 years old) who referred clients to the Exergaming Room. clinicians were excluded if they were unable to participate in a live interview.
Setting	Jewish rehabilitation hospital
Study design	Phenomenological qualitative study using an interpretive description methodology.
Methods and analysis	The exergames room contains two systems where patients can practice outside of their regular therapy sessions. The exergames room staff included an expert clinician who was present one half day per week and an assistant who was present an additional two to three half days per week. physiotherapists or OTs could refer clients to the exergames room by completing a referral form. Ten to twenty minute semi-structured interviews were conducted with each clinician. participants completed a short demographic questionnaire online prior to the interview. a list of open ended questions was developed based on a technology acceptance model. Convenience sampling was used. Interviews were tape recorded and transcribed verbatim by the same researchers who conducted the interviews. A thematic analysis was performed on the data collected by grouping all the open codes into facilitators and barriers, and then categorized into levels, themes and subthemes.
Findings	Major facilitators at the organizational level were: institutional support; at the individual level: personal experience of referring clinician, presence of an expert clinician, and relevance of the Exergaming Room for stroke clients; and at the

	technological level: Perceived ease of use of the exergames and possibility of providing additional therapy. Key barriers to successful implementation of the Exergaming Room at the organizational level were: scheduling difficulties and lack of staffing; at the individual level: client functional limitations; at the technological level: low precision in motion capture of the exergame systems. **Organisational level** **Communication (facilitators and barriers)** Clinicians mentioned that team discussions during interdisciplinary rounds helped facilitate the referral of patients to the exergames room. Therapists felt it was easier to refer in-patients compared to outpatients due to the logistics involved with outer groups and timing. Clinicians reported that insufficient training and lack of hands on practice with the VR systems was a barrier to referrals. most clinicians found the lack of staff and supervision in the room to be a barrier to referral. **Environmental (facilitators and barriers)** The accessibility of the room to patients along with the low amount of resources required to operate the room was deemed to be a facilitator. However some barriers were identified such as the needs for more varied exergames systems, additional rooms and space. Clinicians also mentioned the length of session to be a barrier as patients felt it was too short time to make it worthwhile. **Individual level** **referring clinician factors**

	Clinicians who were familiar with the benefits of VR and were aware of the evidence saw this as a facilitator however for the 3 clinicians who were not familiar with the VR systems this acted as a barrier. **Expert clinician factors** The presence of the expert clinician in the exergames room was viewed by most clinicians as a facilitator as it ensured supervision by an expert whom they trusted. This also made the room easier to use if as they did not need to set it up themselves. **Client factors** Most clinicians indicated motivation as an important facilitator for referral. Barriers included transportation and financial difficulties for out patients needing to commute to the hospital. they were also less inclined to refer clients who were not technology aware. positive feedback from their clients also acted as a facilitator in their decision to refer new patients. functional limitations of the clients that served as barriers included fatigue, communication limitations, physical limitations, cognitive limitations and level of independence. **VR system** Half the participants reports that the variety of activities positively influenced their referral decision. For instances games were function, provided bilateral tasks and worked on versatile goals. Conversely some felt the games failed to challenge clients cognitive, social and problem solving skills. **Therapeutic Benefits**

	All participants saw the room as an opportunity to exercises outside of their regular therapy sessions and a way to increase exposure to activities, complementing their therapy time. Various benefits to rehabilitation were identified by clinicians including; physical such as sitting balance, endurance, and patient empowerment.
Limitations and applicability of evidence	The potential loss of information during translation of interview transcript from French to English may have limited the interpretation of the direct quotes analysed. There may be limited transferability as participants were recruited through convenience sampling and the information obtained was circumstance-specific to the hospital setting in which the study took place. further research with a larger sample side is needed to fully generalise the findings. the study had a major focus on Jintronix and there is limited generalisability to all VR systems. interviewer bias may have been present due to the structure of the interviews.

Study arms

Virtual reality exergaming as adjunctive therapy in a sub-acute stroke rehabilitation (N = 10)
Ten clinicians (four physical therapists, six occupational therapists) from the Stroke Program at the Jewish Rehabilitation Hospital (nine female, one male, age range 25–50 years old) who referred clients to the Exergaming Room

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Norris, 2018

Bibliographic Reference	Norris, M.; Poltawski, L.; Calitri, R.; Shepherd, A. I.; Dean, S. G.; ReTrain, Team; Acceptability and experience of a functional training programme (ReTrain) in community-dwelling stroke survivors in South West England: a qualitative study; BMJ Open; 2018; vol. 8 (no. 7); e022175

Study details

Secondary publication of another included study- see primary study for details	Dean SG, Poltawski L, Forster A, et al. Community-based rehabilitation training after stroke: results of a pilot randomised controlled trial (ReTrain) investigating acceptability and feasibility. BMJ Open 2018;8:e018409
Other publications associated with this study included in review	NR
Aim	Acceptability and experience of a functional training programme (ReTrain) in community-dwelling stroke survivors in South West England
Population	In total, 45 participants were recruited to the pilot RCT, of whom 23 were randomised to receive ReTrain. Inclusion criteria into the pilot RCT itself included: a clinical diagnosis of stroke, discharge from National Health Service (NHS) physical rehabilitation, an ability to walk indoors but with remaining physical deficits, adequate cognitive and communication capacity for participation, and willingness for randomisation.
Setting	community setting in England
Study design	A qualitative approach was undertaken. Of the 45 participants recruited into the trial, 23 were randomised to receive ReTrain. Following a sampling strategy, 10 participants undertook 1:1 semistructured audio-recorded interviews. Transcripts were analysed following a modified Framework Approach.
Methods and analysis	Ten participants in the ReTrain arm of the trial were invited to interview, and all accepted and provided written informed consent. All interviews occurred within participants' own homes and lasted on average 53min (range=28–78 min). In order to adequately explore that experience, we conducted in-depth 1:1 interviews in the location of participant's choice. Interviews occurred after completion of the training programme and the first outcome assessment (approximately 6–7 months post-randomisation).The section of the interview which related to the intervention experience was relatively unstructured and started with the request to describe their experience of the programme. Prompts (when required) included focus on the group nature of the programme, the extent of specificity to their individual needs and any perceived impact of the intervention (both positive and negative). All interviews were undertaken by the same researcher (LP), an experienced researcher and physiotherapist. He was not involved in the delivery of the intervention. This was deemed important to

	encourage frank and free discussion with the participants. With permission they were audio-recorded and transcribed verbatim. The data were primarily analysed by an experienced qualitative researcher (MN) who also was not involved in the delivery of ReTrain. Analysis followed a framework approach. While there were some deductive categories related to participating in the research, most of the framework was created through an inductive process. Line-by-line coding of the transcripts occurred in the familiarisation phase. Codes were cross-checked across transcripts (labelling phase) followed by the development of broader categories and themes (charting phase/ interpretation). A number of processes were put in place to enhance the transparency and trustworthiness of the analytical process. A discussion between the primary analyser and a coresearcher (SGD) occurred after the familiarisation phase to consider initial concepts. Specific negative case analysis occurred between the labelling and charting phase. The final phase of interpretation included further discussion between primary analyser and the research team.
Findings	**'I am moving better'** Participants described that they walked faster, further, were moving more easily, and their balance had improved. Change took some time to appreciate, indicating both the accumulative effect of training but also the patience to see those changes occurring. That required participants to 'bear with' the programme which was sometimes a challenge. Critically it was not just fitness, strength and balance that participants commented on, but also meaningful activities in everyday life. Perhaps expectedly given the focus on activities such as rolling and techniques to independently get off the floor, these were activities that were deemed to improve. **'I can do it** While physical benefits were noted by all, a stronger emphasis was placed by many on the psychological impact of the training. Participants talked about building their spirit, gaining confidence, opening their eyes, positive attitudes of mind, enthusiasm to try and becoming more outgoing. **'A mile and a bit**

As inferred in the first theme, perceived changes came gradually and that sense of incremental build up and gradual challenge was identified as a key factor in the successful delivery of the training. The approach of incremental challenge is a key principle of physical training and therefore its inclusion in the programme and identification by participants is perhaps unsurprising. Despite this, the expectation to push yourself physically caught some participants somewhat off guard and was not necessarily completely welcomed. For others, the resultant fatigue post-training was noteworthy, but not necessarily viewed negatively. For many participants, the developmental nature of the programme or adjustments to their personal life allowed them to cope with the demands of pushing themselves that bit further.

‘The team done really well’

On the whole, the group nature of the intervention was seen as one of its most positive aspects and often discussed as integral to its perceived effectiveness. The concept of the teamwork and shared determination despite different abilities and histories within the groups was discussed by several participants.

‘Speaking our language’

Part of the concept of pushing the participants beyond their natural comfort level was created by the relationship between themselves and the trainers. Participants discussed how the personality of the trainer got them through the hardest parts of the course, encouraging and challenging them to take that additional step. the capacity to juggle group needs alongside individual problems and attention was noted by several participants.

Carrying on

The concept of continuing with more activity after completing the intervention and the concomitant hope of future progress was another theme apparent within some of the interviews. Participants talked about how the training opened their eyes and as a result they were re-evaluating what they should be doing and what possibilities lay ahead. This minor theme indicated that the impact of the training for some participants went beyond the length of the training course itself.

	Possibilities and actions in order to enhance the development of that future progress were discussed and ascribed as a clear impact of their participation in the training. However, the loss of the classes themselves and specifically access to the trainer were a concern, which could potentially impact on the actualisation of that continued commitment.
Limitations and applicability of evidence	Both the data collection and analysis were conducted by experienced qualitative researchers who had good knowledge of the ReTrain programme. While this affords insight which can assist in interpretation, both have also previously been involved in research relating to ARNI and therefore concerns with preconceptions are relevant. The interviews included a subsample of participants within the pilot RCT, but the sampling strategy aimed to ensure there was scope to ascertain a range of narrative representation. As the pilot RCT was based within the Southwest of the UK it is likely that some regional influence may be apparent, including access to ongoing facilities. But care was taken to include rural and urban participants which may have relevance to other areas of the UK. The lack of ethnic diversity within the participant group is also noted.

Study arms

functional training programme (ReTrain) in community-dwelling (N = 10)
10 participants undertook 1:1 semistructured audio-recorded interviews. Transcripts were analysed following a modified Framework Approach.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Schnabel, 2021

Bibliographic Reference	Schnabel, Stefanie; van Wijck, Frederike; Bain, Brenda; Barber, Mark; Dall, Philippa; Fleming, Alexander; Kerr, Andrew; Langhorne, Peter; McConnachie, Alex; Molloy, Kathleen; Stanley, Bethany; Young, Heather Jane; Kidd, Lisa; Experiences of augmented arm rehabilitation including supported self-management after stroke: a qualitative investigation; Clinical Rehabilitation; 2021; vol. 35 (no. 2); 288-301

Study details

Secondary publication of another included study- see primary study for details	Early VERsus Later Augmented Physiotherapy compared with usual upper limb physiotherapy (EVERLAP): a feasibility randomised controlled trial of arm function after stroke
Other publications associated with this study included in review	Early VERsus Later Augmented Physiotherapy compared with usual upper limb physiotherapy (EVERLAP): a feasibility randomised controlled trial of arm function after stroke
Aim	This study aimed to explore the experiences of stroke survivors and their carers of an augmented arm rehabilitation programme including supported self-management, in terms of its acceptability, appropriateness and relevance.
Population	17 stroke survivors and five carers were interviewed after completion of augmented arm rehabilitation.
Setting	Interviews were conducted in stroke survivors' homes, at Glasgow Caledonian University and in hospital.
Study design	A qualitative design, nested within a larger, multi-centre randomised controlled feasibility trial that compared augmented arm rehabilitation starting at three or nine weeks after stroke, with usual care. Semi-structured interviews were conducted with participants in both augmented arm rehabilitation groups. Normalisation Process Theory was used to inform the topic guide and map the findings. Framework analysis was applied.
Methods and analysis	The study was conducted between March 2016 and October 2018. It was nested within the Early VERsus Later Augmented Physiotherapy compared with usual upper limb physiotherapy (EVERLAP): a feasibility randomised controlled trial of arm

	function after stroke. This was a mixed methods, randomised, multi-centre trial. Evidence-based augmented arm rehabilitation (27 additional hours over six weeks), including therapist-led sessions and supported self-management. Semi-structured interviews with stroke survivors and their carers (if present) took place in 97 stroke survivors' homes, at the University, or in hospital, between September 2016 and April 98 2018 following a topic guide (Appendix 1). Interviews were audio recorded and transcribed verbatim by a transcriber who was otherwise not involved in the study. The work of May et al.12 and Murray et al.18 was used to guide the application of Normalisation Process Theory in this study. Normalisation Process Theory was used to inform the topic guide and the analysis of the study findings. Data saturation was achieved after interview number 15 but two more interviews were conducted and no new data emerged. Interviews ranged in length between 16 min. and 71 min. (median 39 min.). During data collection and analysis a reflexive approach was adopted. Field notes were taken for each interview and used to supplement the data collection, to describe the context in which the interviews took place and the researchers' own feelings during field work. The interviews were undertaken by two researchers, including the first author. As physiotherapists, both interviewers had experience working in the health service with stroke survivors. The interviewers were not directly involved in the recruitment to or the delivery of the EVERLAP intervention. Framework analysis was used to analyse the transcripts, which was regarded as the most appropriate approach because it provided a systematic structure to manage and interpret a rich data set. The transcripts were analysed according to the six steps of framework analysis: familiarisation, constructing an initial framework, indexing and sorting, reviewing data extracts, data summary and display, and description Data were managed using the software NVivo11. All identifiable data (names, places) were removed from the transcripts. Audio recordings were listened to, transcripts were read repeatedly and a coding framework was established. The coding framework was further refined with each transcript read. For each emerging theme a matrix was created which had several subthemes.
Findings	During the analysis, three main themes were identified: (1) acceptability of the intervention (2) supported self-management and (3) coping with the intervention. **Acceptability of the intervention**

All stroke survivors and their carers felt positive about the augmented arm rehabilitation programme. Specifically they liked the intensity of the arm rehabilitation, the supportive nature of their interaction with the study physiotherapists, and the majority liked the opportunity to engage in supported self-management. Activities that were tailored to stroke survivors' needs and real-life activities that were meaningful to their daily lives, were perceived as being particularly valuable. Stroke survivors also appreciated that the activities were built on what was done the day before, challenging them a bit further. All stroke survivors and their carers felt that the intensity of the EVERLAP intervention was acceptable and well tolerated. Those stroke survivors and carers who engaged in supported self-management reported that they coped well, implementing the 45 minutes of exercise into their daily routine, and did not see it as a burden. Several of the stroke survivors and their carers felt that six weeks of augmented arm rehabilitation was sufficient as they felt that the study physiotherapists had shown them most exercises and were not sure if a longer duration would have resulted in any further improvements. Some reported that six weeks was not long enough and suggested that rehabilitation programmes should be extended to 12 weeks.

Supported self-management

Supported self-management practice that was encouraged as part of the therapist-led sessions was reported to be valuable. It helped stroke survivors to feel in control of their rehabilitation progress and provided a focus after discharge. The majority of stroke survivors reported that they engaged in supported self-management every day or most days and had established a routine for doing the exercises. They reported on integrating supported self-management into a daily routine so that exercising did not feel like a burden to them. However, three out of four stroke survivor participants who were male and over the age of 70 reported that it was easier for them to engage in the exercises when the study physiotherapist was present but that they did not do so when they were on their own at home. Several stroke survivors reported that they were self-motivated to engage in exercises themselves. Most motivation was related to specific goals such as acquiring better dexterity. It was often reported that tiredness, self-reported 'laziness', pain and other commitments such as engaging with visitors or home helpers imposed barriers to supported self management. A facilitator for engaging in supported self-management was the exercise booklet and the mobile phone reminder, which was offered to everyone in the study.

Coping with the intervention

	Several stroke survivors reported that they had a carer who was involved in their rehabilitation. The majority of those included said that their carers acted as a reminder and sometimes a controller for doing supported self-management. These findings show that the engagement and commitment of a support network is vital in the recovery after stroke. Most stroke survivors reported that they were actively involved in the decision-making on their goals and rehabilitation plan in relation to EVERLAP whilst others were happy to let the study physiotherapists decide on the rehabilitation plan.
Limitations and applicability of evidence	A limitation was that this study included a selective sample; participants were probably motivated to engage in augmented rehabilitation. However not everyone in the Early and Later groups completed the study and for ethical considerations those who did not complete were not involved in the interviews. Therefore, only selected findings can be reported from this study, which may not reflect what the excluded stroke survivors and their carers experienced. An additional limitation was that self-management activities were not logged, as no tool could be identified that was valid and feasible for this study population across study settings. Therefore it is unclear how much supported self-management stroke survivors actually engaged in.

Study arms

augmented arm rehabilitation (N = 22)
Evidence-based augmented arm rehabilitation (27 additional hours over six weeks), including therapist-led sessions and supported self-management. 17 stroke survivors and five carers were interviewed after completion of augmented arm rehabilitation.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Signal, 2016

Bibliographic Reference	Signal, N.; McPherson, K.; Lewis, G.; Kayes, N.; Saywell, N.; Mudge, S.; Taylor, D.; What influences acceptability and engagement with a high intensity exercise programme for people with stroke? A qualitative descriptive study; Neurorehabilitation; 2016; vol. 39 (no. 4); 507-517

Study details

Secondary publication of another included study- see primary study for details	Qualitative study nested within pilot RCT
Other publications associated with this study included in review	NR
Aim	To explore the factors that influence the acceptability of, and engagement with, a high intensity group-based exercise programme for people with stroke.
Population	Pts recruited to a pilot RCT. Aged >18 years, had a single disabling stroke at least 3 months prior, able to walk 10m and had a gait speed of between 00.5 to 1.3m/s at entry.
Setting	New Zealand, stroke rehabilitation centre
Study design	Qualitative descriptive study nested in a mixed methods RCT, single blind pilot trial.
Methods and analysis	Semi-structured interviews with an interview guide were used to explore the acceptability of high intensity exercise and the barriers and facilitators to engagement. interviewers were independent from other aspects of the trial. participants were invited to include family members in the interview. interviews lasted between 20-45 minutes. Interviews were recorded, transcribed and analysed using qualitative content analysis. transcripts were imported into NVivo 10 software and re-coded.

	constant comparison within and across codes and data sources and the use of memos to record details of the codes and keep track of initial impressions about the data hypothesised interactions between codes.
Findings	**Making progress** Identification of positive outcomes in response to the intervention appeared to be a powerful modifier of pts perceptions of the intervention and their ability to continue to engage. this was not limited to improvements in physical function. Participants identified a range of gains in impairment including cardiovascular fitness, endurance, strength, range of motion, muscle tones, communication ability, mental alertness and confidence. Additional participation gains included taking on roles within and beyond the home and engaging in sport and leisure activities. **Sourcing motivation** All participants referred to sources of motivation including self-motivation and other sources that encouraged and helped them sustain their engagement. motivation from other sources included family, having an altruistic view towards research and other members of the group. **Working Hard** the requirement to work at a high intensity during the intervention did not negatively influence the acceptability of the intervention. many participant's valued how the intensity of physical and mental effort forced them to focus and work hard and linked this to their success. some identified a link between hard work and reward 'no pain no gain' and some commented on the hard work becoming repetitive and requiring an attitude of 'slogging it out'. **The people** the majority of participants referred to the groups positively describing a sense of belonging, camaraderie and caring. the group also provided a sense of competition. participants also valued the physiotherapists clinical expertise, the care and

	attention they provided and their ability to motivate and help the participants to maintain focus during the training and their belief in the participants to be successful. The people in the group and physiotherapists was a powerful promotor of engagement. **Fit with me** all participants described how well the intervention's met their needs and goals. a number described the intervention as being suitable for everything not just those with stroke. none of the pts who were more severely affected by their stroke identified their disability as a limiting factor for engagement. patients with co-morbidities discussed how the intervention had to be modified to meet their needs. some participants described their previous experience of exercises and the type they enjoyed doing related their their enjoyment of the intervention. the less relevant the individual perceived the intervention to their specific needs and desires the more challenging ongoing engagement was. **Fit with my life** The ease in which exercise 3 x per week for 1 hour was integrated into their lives was discussed by the majority. However for some it was hard to accommodate. the routine provided structure and purpose to some participants days which was valued. unexpected life events influence some participants ability to engage in the intervention. factors which facilitated engagement included the provision of transportation, the location of the venues, accessibility of parking, availability of amenities such as a cafe, and administrative and family support.
Limitations and applicability of evidence	one potential limitation is that half of the potentially eligible participants did not want to engage in research investigating high intensity rehabilitation. while it was not possible to explore why potential participants were unwilling to take part in the

	study, previous research empathised that multiple factors including the perception that exercise will not make a difference can act as a barrier.

Study arms

high intensity group-based exercise (N = 14)
qualitative descriptive study included 14 people with stroke who had completed a 12-week, high intensity group-based exercise rehabilitation programme. Semi-structured interviews were used to explore the acceptability of high intensity exercise and the barriers and facilitators to engagement.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Stark, 2019

Bibliographic Reference	Stark, A.; Farber, C.; Tetzlaff, B.; Scherer, M.; Barzel, A.; Stroke patients' and non-professional coaches' experiences with home-based constraint-induced movement therapy: a qualitative study; Clinical Rehabilitation; 2019; vol. 33 (no. 9); 1527-1539

Study details

Secondary publication of	Home CIMT cluster RCT - Barzel A, Ketels G, Stark A, et al. Home-based constraintinduced movement therapy for patients with upper limb dysfunction after stroke (HOMECIMT): a cluster-randomised, controlled trial. Lancet Neurol 2015; 14(9): 893–902.

another included study- see primary study for details	
Other publications associated with this study included in review	NR
Aim	What are the experiences of chronic stroke patients and non-professional coaches with homeCIMT?
Population	Patients were 18 years of age or older and had suffered a stroke at least six months prior to enrolment in the HOMECIMT trial with subsequent mild-to-moderate impairment of arm function and a minimal residual hand function, no or mild-to-moderate impaired verbal communication and had been participating in the intervention group of the trial.8 Non-professional coaches were family members and life partners, rarely friends, who had agreed to support a patient with homeCIMT in the context of the HOMECIMT trial. Patients with impaired verbal communication were not excluded from taking part in an interview if their non-professional coach agreed to participate in the interview to support the patient in expressing her or his experiences. Apart from patients with speech disorders, we aimed at conducting individual interviews with patients and non-professional coaches without special focus on including particular dyads. However, if both, the patient and the associated non-professional coach, were interested in an interview, we allocated two individual interviews. 13 stroke patients and 9 non-professional coaches' alias family members who had completed the four-week homeCIMT programme in the context of the HOMECIMT trial.
Setting	Community based in germany
Study design	Qualitative study embedded within a cluster randomized controlled trial investigating the efficacy of homeCIMT to improve the use of the affected arm in daily activities
Methods and analysis	Regarding qualitative data collection, semi-structured interviews were conducted using almost the same interview questions for patients and non-professional coaches to facilitate comparability. All interviews were carried out over the period of December 2012 to June 2013 and were conducted in the interviewees' own homes or in an alternative private venue

	according to their preference. The interval between interview and completion of homeCIMT was on average 248 (SD: 160; min: 45, max: 565)days. The duration of the interviews varied between 13 and 123 (mean: 37, SD: 24)minutes. The interviews were tape-recorded and transcribed verbatim. The procedure of the phenomenological data analysis was conducted as follows: at first, each transcript was read several times to get a general impression of the interviews. Subsequently, ‘significant statements’ about the patients’ and non-professional coaches’ experiences with homeCIMT were identified and highlighted. Thereafter, ‘significant statements’ were combined to create themes. Finally, the experiences of patients and non-professional coaches were described in thematic sections by writing and rewriting their experiences.17,18 MAXQDA 11 software was used for analysing the qualitative data. Data saturation was achieved after the 13th patient interview and the 9th nonprofessional coach interview because the analyses of these interviews did not reveal new themes regarding homeCIMT experiences.
Findings	**HomeCIMT can be integrated into everyday life with varying degrees of success** For employed patients as well as non-professional coaches regardless of employment status, the lack of time was considered a stress factor. An employed patient reported that he experienced performing homeCIMT in the evening after a full working day as demanding and his muscles of the affected arm did not feel as strong as in the morning, which made the exercises more difficult for him. A reduced capacity and the feeling that managing everyday life was challenging enough after having suffered a stroke were perceived as additional reasons why homeCIMT was not always easily carried out in everyday life. **Training together may produce positive experiences as well as strain** Both patients and non-professional coaches described practicing together during homeCIMT as a positive experience in the sense of spending more time with each other. Patients and non-professional coaches also reported difficulties while training together. At times, patients perceived the non-professional coaches’ comments on training performance and intensity or the use of the affected arm as stressful or annoying. Work or household commitments of the non-professional coaches were other reasons patients reported in the interviews for practicing alone and not always together with their non-professional coach as determined at the beginning of the four-week course of homeCIMT

Self-perceived improvements during and following homeCIMT

Patients and non-professional coaches reported improvements they had perceived during and following the course of homeCIMT, such as enhanced use and/or increased awareness of the affected arm in everyday life, improved function (e.g. hand mobility) or improved performance of CIMT-specific exercises. non-professional coaches also mentioned that the success of homeCIMT would have been even greater if the stroke-affected relative would have shown more motivation to participate in the therapy. Furthermore, they said improvements were only feasible with a lot of willpower, endurance and regular training. Other patients and non-professional coaches mentioned they had expected more or long-lasting improvements. Patients, who, from their point of view, considered the therapy as not being successful, stated the following reasons: the four-week period was considered too short to make reasonable improvements, the stroke had occurred too long ago or the affected upper limb had too few functions. Patient 5 assumed that she probably had set her goals too high and recommended taking smaller steps and not to have exaggerated expectations.

Using the affected arm in everyday life is challenging

interviewees perceived the advanced and increased use of the affected arm through homeCIMT in everyday life as an improvement. However, using the affected arm in everyday life with simultaneous immobilization of the healthy arm was also a challenge. Other patients described the performance of their stroke-affected arm during daily life activities as ‘slow’, ‘clumsy’, ‘unattractive’, ‘exhausting’ or simply ‘difficult’. Right-handed patients with a left-side-affecting stroke regarded it partially senseless to use their stroke-affected left hand for activities they normally performed with their right hand and perceived the required enhanced use of their left hand as a ‘double burden’. There were also patients who reported that they refused or minimized wearing the glove as they felt insecure without relying on the full capacity of their non-affected hand. This experience was in line with the report of non-professional coaches.

Subjective evaluation of and experiences with homeCIMT-specific exercise

perceived exercises as positive and meaningful if they led to an improved performance or if the exercises were linked to a meaningful activity of daily life. Exercises were also seen positive if they were achievable although difficult. Patients had a positive experience with the fact that the more often they repeated an exercise, the better the exercise performance and the better the function of the impaired arm. Patients experienced the therapists’ motivation as particularly meaningful and felt

	motivated to stick to the therapy over the four-week course. However, there were also patients who said that more support from their therapists would have increased their motivation.
Limitations and applicability of evidence	interviewed patients (mean age: 57.3years, SD: 9.0years) were of younger age considering that the majority of strokes in Germany occur above the age of 60years. interviews generally took place 248 days after the completion of homeCIMT. Therefore, one should keep in mind that patients' and non-professional coaches' recollections of homeCIMT might have changed over time. Fourth, homeCIMT is a form of constraint-induced movement therapy developed for chronic stroke patients in ambulatory care. The users' perspectives on constraint-induced movement therapies in more acute stages following stroke may be different and therefore need to be examined in other comprehensive qualitative studies.

Study arms

home-based constraint-induced movement therapy (N = 22)
13 stroke patients and 9 non-professional coaches' alias family members who had completed four-week home CIMT programme in the context of the HOMECIMT trial

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Sweeney, 2020

Bibliographic Reference	Sweeney, Gillian; Barber, Mark; Kerr, Andrew; Exploration of barriers and enablers for evidence-based interventions for upper limb rehabilitation following a stroke: Use of Constraint Induced Movement Therapy and Robot Assisted Therapy in NHS Scotland; British Journal of Occupational Therapy; 2020; vol. 83 (no. 11); 690-700

Study details

Secondary publication of another included study- see primary study for details	NR - part of an RCT which was not published at the time
Other publications associated with this study included in review	NR
Aim	This study will address the following research questions: 1. What do NHS Scotland therapists perceive to be the main benefits and barriers for patients in regard to the use of CIMT and RAT? 2. What do NHS Scotland therapists perceive to be the main barriers and enablers for services in regard to the implementation and sustainability of each intervention? 3. What are the barriers and enablers of each intervention? 4. To what extent are CIMT and RAT used within clinical practice in NHS Scotland rehabilitation services?
Population	Participants were recruited from three acute stroke units in NHS Lanarkshire over a three-year period, with the following criteria for selection, (devised using CIMT criteria (Taub et al., 1993) and guidance provided by the robotic device manufacturer); Inclusion criteria: • Diagnosis of new stroke event within 3 months • Medically stable as determined by a medical consultant • Degree of upper limb impairment directly linked to stroke event • At least 10° of active extension of each metacarpophalangeal joints, interphalangeal joints of all the digits and 10° wrist extension of the affected limb. • No excessive spasticity in any of the joints of the affected UL (shoulder, elbow, wrist, fingers) • Ability to follow single word instructions and perform study tasks • Willing to provide written informed consent Exclusion criteria: • Involvement in any other rehabilitation research study • Significant cognitive impairment (Score of less than 73/100 in Addenbrookes Cognitive Examination ACE-III) • Subjects with excessive pain in any joint that might limit participation • Recent fracture in affected upper limb (within 12 months) • Communication difficulties which would severely impact on ability to participate in self report measures and semi structured interview. Semi-structured interviews were completed with patients after stroke who had completed either a programme of mCIMT (n=2) or RAT (n=6), which were delivered as part of aforementioned clinical trial. The inclusion criteria for these participants was therefore the same as the clinical trial and assignment into one of the intervention groups.

Setting	Three NHS acute stroke units
Study design	This qualitative study was embedded within a larger feasibility randomised controlled trial (RCT), the full results of which are yet to be published. A combination of a cross-sectional online survey with therapists and semi-structured interviews with stroke patients were used. Semi-structured interviews were completed with patients after stroke who had completed either a programme of mCIMT (n=2) or RAT (n=6).
Methods and analysis	Semi-structured interviews were carried out, audio recorded, and transcribed verbatim by an independent interviewer (experienced psychology student). Interviews were carried out either in the participant's home or in a hospital outpatient setting, depending on the participant's preference. An interview guide was produced using 'a framework for the development of a qualitative semi structured interview guide' as described by Kallio et al. (2016). Questions were based around their experience of the intervention and their views on benefits and challenges of such. Care was taken to avoid leading questions. A thematic analysis approach was used to analyse responses to open questions from both the survey and interviews (Braun and Clarke, 2006)
Findings	**CIMT user experience (n=2)** Theme 1. Functional Improvement: Participants cited functional improvement as the main benefit from the intervention naming activities of daily living they were now able to perform following the programme. "Putting my shoes on, putting my underwear on, my trousers….well I can do most things now" Participant 12 Theme 2. Adherence to protocol: Despite therapists' concerns in previous studies that patients may have difficulties adhering to CIMT practice and constraint device schedules, this was not reported by the two interviewed participants. Instead participants reported positive experiences with the protocol. Also, contrary to the therapist's concerns cited in the

survey discussed in this study that frustration may impact on adherence, neither participant highlighted this as an issue, with only mild frustration with particular activities discussed during both interviews. Instead both participants perceived the programme as mildly frustrating hard work, mitigated by positive outcomes.

Theme 3. Feedback: The feedback received through the use of timing specific tasks/activities to gauge potential improvement was identified as a motivating factor within the programme in both interviews. “they started timing them (activities) to show you the difference in time from when you start to when you finish…to see before and after was just amazing to be honest. It was like day and night” “It was just a confidence booster to see you were getting quicker” Participant 9

Theme 4. Competitive nature: It should be noted that both participants could be described as being intrinsically motivated (Ryan and Deci, 2000), defined as the doing of an activity for its inherent satisfaction rather than for some separable consequence. This may be a contributory factor in their adherence and acceptability of the programme. "I was just trying to beat myself all of the time” Participant 12

RAT user experience (n=6)

Theme 1. Motivation: The majority (67%, 4/6) of participants reported high levels of motivation. “It kind of pushed you as far as you wanted to go, or it was up to you how far you wanted to go with it” Participant 1. With one participant acknowledging improved motivation through attending sessions. “I couldn’t motivate myself the same (at home) as I could up here. You need that wee bit of push” Participant 7 This may be due to the need for extrinsic motivation, which is present when an individual performs a behaviour for an extrinsic reason (Dacey et al., 2008), such as a reward or praise from a clinician.

Theme 2. Improvement All participants felt the main benefit of RAT was an increase in strength of the affected arm, with some also reporting an improvement in active movement. “You could feel it, my grip getting stronger every week, and

	movement” Participant 7 Compared with the mCIMT group, however, participants were less likely to mention a change in functional performance, with only 50% (3/6) recognising this as a benefit of the intervention. Theme 3. Non-use of the affected arm: Participants reported continued ‘non-use’ of the affected arm. This may account for the lack of perceived impact on functional performance. “I tend to use my right (non-affected) arm now” Participant 7 “I’m still not using my left (affected arm) as much as I used to” Participant 10 Theme 4. Technical Issues: 83% (5/6) reported issues with the software/games, indicating this was at times a source of frustration. “There was some of the games, you could say were a bit tedious. That was maybe because they didn’t tax you enough” Participant 1 “Some of the games are frustrating” Participant 3 Theme 5. Weight compensation: Half the participants (3/6) reported benefits attributed to the weight compensation properties of the robotic arm. It is worth noting that these participants had less range of movement and strength in their affected arm compared to the other participants. “I couldn’t lift it, the robotic arm showed me. It’s on there and they take gravity out of it, I could lift it up. I was going up to the top and getting things, and away back down, that’s when I said, this can be done” Participant 3 Theme 6. Novelty: As hypothesised in a Cochrane review (Mehrholz et al., 2018), half the participants (3/6) indicated a novelty aspect to the treatment which may have led to increased enjoyment and consequently acceptability of RAT. “It was different from what your normal occupational therapy was and, because of that I think it was probably a bit more enjoyable” Participant 1
Limitations and applicability of evidence	Due to small sample sizes, care should be taken when generalising these findings as the data obtained is unlikely to have reached saturation (Weller et al., 2018).

	A convenience sample of stroke patients was used for the semi-structured interviews, consequently it is likely to be biased (Etikan et al., 2016). The selection criteria and use of a group who are already motivated to take part in an RCT, contribute to this bias. It is also acknowledged that the number of participants interviewed following completion of a mCIMT programme was less than that of those following RAT. This was due to recruitment and retention of participants into the main pilot RCT. A limitation of the study is the lack of interviews completed with patients who may have declined to participate in the novel interventions or dropped out of the programmes. Further qualitative research with this patient group may help us to further understand rates of uptake and attrition for these upper limb programmes

Study arms

CIMT and robot therapy post stroke (N = 8)
Exploration of barriers and enablers for evidence-based interventions for upper limb rehabilitation following a stroke: use of Constraint Induced Movement Therapy and Robot Assisted Therapy in NHS Scotland. Semi-structured interviews were completed with patients after stroke who had completed either a programme of mCIMT (n=2) or RAT (n=6), which were delivered as part of a clinical trial.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Taylor, 2018

Bibliographic Reference	Taylor, E.; Jones, F.; McKevitt, C.; How is the audit of therapy intensity influencing rehabilitation in inpatient stroke units in the UK? An ethnographic study; BMJ Open; 2018; vol. 8 (no. 12); e023676

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	To investigate the delivery of therapy on stroke units in the policy context of the 45 minute guideline and auditing of therapy intensity.
Population	Purposive and pragmatic sampling methods were used to select stroke units with different characteristics that were considered by the team to have the potential to influence the response to the research question, allowing a wide range of perspectives. For interviews, the core sample sought in each site included: ► Staff from each of the three therapy professions (OT, PT and SLT) and TAs. ► Staff with diversity in years of experience and seniority. ► Patients working with therapists, with contrasting characteristics such as level of impairment/dependence, social situation, discharge destination, ethnicity and age.
Setting	An ethnographic approach was used to study therapy practice in three different stroke units in the UK in an NHS setting.
Study design	Ethnographic study, including observation and interviews. The theoretical framework drew on the work of Lipsky and Power, framing therapists as ‘street level bureaucrats’ in an ‘audit society’.
Methods and analysis	Various potentially relevant theories were considered during the course of data collection, and appraising their usefulness in illuminating the driving forces underpinning the findings was a part of the ongoing data analysis. The theoretical framework for the analysis presented here drew on the work of Lipsky and Power, framing therapists as street-level bureaucrats in an audit society. Lipsky’s theory of street-level bureaucracy concerns the implementation of policy through direct encounters between front line public service workers and citizens. The power relation of audit is hierarchical and paternalistic, involving the scrutiniser and the observed. The observed are not involved in discourse, but instead become objects of information.

	The focus is to produce a quantifiable score and rank departments and institutions against each other. Use of this theory enabled a broader perspective and prompted an understanding of SSNAP as part of a wider context of audit culture. Forty three participants were interviewed including therapy staff, doctors, managers, a nurse, patients and a patient's wife. Interviews typically lasted for approximately 1hour. In each site, there were different prominent figures who appeared relevant to interview in addition to these core participants. For example, in one site, a lead nurse was influential in decisions about when to withdraw therapy and was a driving force for a focus on SSNAP within the wider multidisciplinary team; therefore, it was considered valuable to interview her. Nobody declined an invitation to participate; therefore, interviewees were selected based on availability
Findings	**What counts? Who counts?** The SSNAP audit records the quantity of therapy time provided to patients, but there were key differences in what was considered to count as therapy in each site. In one stroke unit, therapy was interpreted broadly. It could include groups and individual sessions in a range of environments, such as the gym, kitchen or outdoors. There, building therapeutic rapport and listening to patients' concerns were considered to be valid use of therapy time. A narrower conception of therapy was evident in the two other stroke units, where there was a stronger emphasis on getting patients to the minimal level of physical ability required in order to discharge them. The influence of the local contextual factors on the delivery of therapy came through strongly in observations at each hospital. Provision of stroke unit rehabilitation beyond the essentials required for discharge was considered an 'old-fashioned model'. A shift of emphasis from treatment to discharge planning was acknowledged by leaders in Sites B and C. For therapists in all stroke units, there was ambiguity about what counted as auditable therapy. Therapists in all stroke units made individual decisions about how to record their time for the audit. Some strictly adhered to their perception of the rules of the audit that only face-to-face time should be counted. Others would say things like 'his discharge paperwork will be his session today'. They would justify the recording of administration as therapy time based on the argument that facilitating the patient's discharge was their therapy priority and should therefore be seen as valuable use of their therapists' time. **'The quality beneath'** Therapists in each site expressed a lack of confidence in the SSNAP therapy data, both nationally and locally, and they did not believe the data reflected the quality of therapy provided either for their own teams or at a national level. Therapists in all sites discussed having internalised the message that 'more is better', but this had become a voice of guilt in the backs of

	their minds rather than something that changed their practice. Patients were less concerned about the quantity of therapy offered to them than the quality of care and the nature of the therapy they received. In general, patients felt that the professionals involved should know best about what they needed, but they consistently wanted to be involved in the discussion and treated as individuals, and this was not their experience. **Competition and commissioner-centred care** In all sites, teams expressed scepticism about neighbouring services' SSNAP practices. Therapists attended regional meetings and heard about how colleagues in other services were reporting SSNAP data, so were aware of the variation in audit practices across services. They questioned the quality of the national audit data for therapy, and they used language such as 'bending the rules', 'playing the numbers game' or 'lying' when discussing the practices of other teams. Some had visited neighbouring hospitals to find out about their audit practices. Few therapists associated SSNAP scores with quality of care, while most saw them as something services needed to use to 'please the commissioners', suggesting that the way the audit was implemented encouraged commissioner-centred rather than patient-centred therapy delivery. **The influence of local clinical leadership** In each site, it was evident that local clinical therapy leaders shaped priorities regarding the delivery of therapy and influenced attitudes regarding the 45min guideline and SSNAP audit. Their specific roles differed, but in each site, there was someone influential who clinicians respected, but who also had responsibility for ensuring implementation of top-down mandates. They would filter the many policies and mandates coming through to them, and promote, emphasise or soften them according their own judgement. Clinical leads in all sites talked about not wanting to put pressure on therapists to meet the target of therapy intensity. They gave various reasons for not prioritising this among the different top-down mandates they were expected to reinforce to their teams. These included believing that using session length as a measure of the quality of therapy was problematic; believing it was unachievable; and wanting to protect therapists from additional pressure. Therapy staff identified opportunities for quality improvement at a local level, and this appeared to be more influential on them than national policy.

Limitations and applicability of evidence	A possible criticism of this design is that our account is interpretative and open to discussion and alternative analyses. During fieldwork, we noticed some practices and attitudes change, therefore completing the study at a different time could have captured different findings. The study was conducted in an NHS setting and very applicable.

Study arms

delivery of stroke unit therapy (N = 43)
The UK has introduced an audited performance target: that 45min of each therapy should be provided to patients deemed appropriate. This study sought to understand how this has influenced delivery of stroke unit therapy

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Van Kessel, 2017

Bibliographic Reference	Van Kessel, G.; Hillier, S.; English, C.; Physiotherapists' attitudes toward circuit class therapy and 7 day per week therapy is influenced by normative beliefs, past experience, and perceived control: A qualitative study; Physiotherapy Theory & Practice; 2017; vol. 33 (no. 11); 850-858

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	What are the beliefs of physiotherapists related to attitudes, subjective norms and perceived control that influence their adoption of research evidence, in particular evidence for circuit class therapy and 7-day therapy in stroke rehabilitation
Population	A stratified purposive sampling method was used to select physiotherapists to participate. Stroke rehabilitation centres were selected based on the following criteria: 1) diversity in the region and health system; and 2) similarities in the models of stroke rehabilitation service delivery. secondly, physiotherapists within these units were recruited to reflect a range of perspectives based on: 1) experience in the provision of stroke rehabilitation services including practical experience or theoretical knowledge of 7 day and circuit class therapy; 2) years of practice; 3) education level: and 4) seniority. 15 physiotherapists from 6 different stroke rehabilitation centres provided data. participants included 2 managers of a physiotherapy departments, 6 senior stroke rehab physiotherapists and 7 junior physiotherapists. the average experience was 9.5 years.
Setting	6 rehabilitation centres in Australia
Study design	qualitative study design using semi structured interviews

Methods and analysis	semi structured interviews were conducted either on the phone or at the work place by the first author using a question guide. the questions were constructed to elicit data about the behavioural, normative and control beliefs that underpin the Theory of Planned Behaviour. The questions were reviewed by the research team and modified throughout the data collection and modified in response to the developing analysis. Each interview was recorded and transcribed by a transcription service and the interviewer verified the audio tapes against the transcripts. each transcript underwent an initial analysis before the next interview in order to operationalise the stopping criterion. this involved coding the text and keeping memos of first impressions. an audit trial kept a record of the codes generated for each transcript. this trial was used to identify the point that new codes ceased to emerge and was used to inform when to exit the field and cease date collection. the qualitative directed content analysis utilised the theory of planned behaviour as the framework for analysis. once data had reached saturation all researchers read and coded the transcripts repeatedly to achieve immersion in the data as a whole. codes were labelled and then collated.
Findings	**7 Day stroke rehabilitation** Attitudes All the participants had a positive attitude to 7-day services but the managers were influenced by others, such as senior staff and researches, while the junior therapists were influenced by observations on the effects on patients. Managers favourable evaluation was ascribed to a conviction about the importance of implementing research evidence into practice. They also described being influenced by the relations they had with individuals who were active researchers in stroke. Most had a positive attitude about 7-day rehabilitation based on the effects on their patients. only one therapist had a negative attitude based on their personal experience that the quality of therapy over a weekend may not consistently match weekday services. Beliefs managers believed that a 7-day therapy service increased the amount of therapy time, but perceived the benefits to be in preventing patient deterioration over the weekend, or reducing the effects of deconditioning during hospital stays, rather

	than improving function. the physiotherapist positive attitude reflected their belief that 7-day services increased therapy time which contributed to improved function and some based this on positive feedback from patients. **Circuit class therapy** Attitudes the managers conveyed a positive attitude to the models of circuit class therapy based on its ability to address research findings and contribute to patient and hospital outcomes. By contrasts physiotherapists described ambivalent attitudes to circuit class therapy. Physiotherapists described a number is limitations of circuits class therapy to explain their ambivalence and tended to support their positive attitude with descriptions about observations of the effect of classes on patients behaviour such as increased social interactions. Overall they perceived circuit class therapy as a good adjunct to their individual therapy sessions. Beliefs While all the participants believed that physiotherapy services for people with stroke should be delivered through a model that increased intensity of therapy and therapy time along with addressing functional goals. no participants specifically mentioned a link between circuit class therapy and enhances functional improvement. instead the physiotherapists focused on the social benefits including empowerment and motivation. physiotherapists believed that patients should have the choice to participate in therapy over the weekend or have time off with their families. **Perceived control over implementing circuit class therapy and 7-day therapy**

	The physiotherapy managers conveyed a high level of self-efficacy that their service could provide quality evidence-based practice care to patients. this was based on the support from their organisation, their staff and their professional network. constraints to their management decisions were more likely to be in the form of issues with resources. all participants believed the predominant barrier to using either 7-day therapy or a circuit class therapy model was the patients characteristics. Patients who needed lots of support and lacked agency were seen to create barriers to participation. therapists also felt that their ability to implement circuit class therapy was limited by the need to keep therapy safe and it was more difficult when dealing with patients with diverse needs. the physiotherapist felt that their ability to implement 7-day therapy was limited by patient fatigue and the physiotherapists perception that patients may prefer spending time with families at weekends. **The influence of experience** The physiotherapists beliefs were linked strongly to their experiences, including university training, professional development, observation of colleges, previous work experience, current work experience and direct experience with research. physiotherapists advocated that stroke rehabilitation models should support physiotherapists to modify and adapt approaches to the goals of the individual patients and respond to the diversity of patient needs.
Limitations and applicability of evidence	caution should be taken to generalise these finding to other centres with different experiences or cultural norms. other limitations include that some study participants were recruited via a larger research project. this meant that much of their experience with circuit class therapy and 7-day therapy was based on patients who were randomised to receive this as part of a research trial. furthermore some participants had no personal experience of delivering 7-day therapy. finally the theory of planned behaviour may be limited din its ability to predict behaviour based on the measurement of intention.

Study arms

Physiotherapists delivering circuit classes (N = 15)
Fifteen physiotherapists from six rehabilitation centers who ranged in seniority, experience, and education levels consented to be interviewed. The transcribed interviews were analysed using a qualitative content analysis drawing on the Theory of Planned Behavior.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Vive, 2020

Bibliographic Reference	Vive, S.; Bunketorp-Kall, L.; Carlsson, G.; Experience of enriched rehabilitation in the chronic phase of stroke; Disability & Rehabilitation; 2020; 1-8

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	Vive S, af Geijerstam J-L, Kuhn HG, et al. Enriched, task-specific therapy in the chronic phase after stroke: an exploratory study. J Neurol Phys Ther. 2020;44(2):145–155.
Aim	As interventions move from simple to more complex, evaluation becomes more challenging. Practitioners, policymakers, and researchers are increasingly interested in the evaluation of complex interventions consisting of multiple interacting components. Moreover, the base of evidence for the effectiveness of an EE paradigm in clinical stroke rehabilitation needs to be increased. No studies have been conducted combining environmental enrichment and intense rehabilitation and why it is important to understand the experience from participants involved.

Population	Stroke survivors who had just completed an ETT program were interviewed in semi-structured focus groups interviews. The participants were Swedish or Norwegian stroke survivors who had applied to a Swedish rehabilitation agency that provides rehabilitation services in Spain. The study aim was narrow, and the combination of participants was highly specific. Eligibility criteria: At least 6 months and a maximum 10 years after the onset of stroke Disability grade 2–4 on the modified Rankin Scale a Baseline motor deficit defined as less than a full score on the M-MAS UAS, No other injury, illness or addiction, making the individual unsuitable for participation, including exercise-induced epilepsy, assessed by the referring or prescribing physician. Cognitive and speech ability that enables being interviewed in group. Gender - Female: 8 Male: 12 Mean (SD) Age: 61 (13.1) Mean (SD) time since stroke: 30.4 (34.1)
Setting	The ETT was conducted at two rehabilitation facilities in Spain, near Marbella and Malaga, respectively, where the climate is suitable for both indoor and outdoor activities. The ETT was individually tailored and took place in a group setting. Participants did the exercises in groups of 4–9 in the same room/ place.
Study design	Qualitative interviews were conducted in six focus groups. The interviews were analysed with qualitative content analysis.
Methods and analysis	The participants were interviewed in seven focus groups, each with 3–4 participants, at the rehabilitation facility immediately after the intervention. Interviews were conducted by a physiotherapist with experience in stroke rehabilitation who was not a member of the rehabilitation team and no previous relationship with the participants. The moderator had little experience from focus group interviews, but was supervised by a person highly experienced in qualitative research. The interviews were semi-structured and based on an interview guide. The questions in the guide provided starting points for the discussion, during which additional questions were raised. The interviewer did not steer the conversation if the interviewees themselves raised a topic.

	Seven focus groups were conducted with 23 participants; however, only six groups were included owing to technical recording and sound problems in the fifth interview. The interviews lasted for 29–64 min. Twenty informants were included. The data were not analysed until all interviews were done. The interviews were recorded and transcribed by the moderator and S.V, and the content was analysed. First, one of the authors (S.V.) listened to each interview several times to get a general idea of the data content and then scrutinized the transcript to identify meaning units—one or more sentence or paragraphs of a narrative—that referred to the participant's experiences of ETT. The meaning units were then condensed, interpreted, and coded. Next, the co-authors read the initial analysis, discussed the condensations and codes, and modified them as needed. The codes were then analysed and grouped by the first author into subcategories. After reading the analysis as a whole, the authors discussed and compared the findings until agreement was reached. Next, categories were expressed from the subcategories, and an overall theme was extracted. The interviews in their original form served as a reference point throughout the analysis.
Findings	**The program—different and hard!** These experiences included the demanding nature of the training, the difference between this intervention with regard to what rehabilitation they had received before; more individualized and more intense. The subcategory Hard, innovative therapy describes the strenuous nature of the training. Some participants thought it might have been the hardest thing they had experienced so far. Participants also noted that when they managed to perform a task, the rehabilitation team increased the level of difficulty. According to the participants, the interventions differed considerably from the rehabilitation they had received at home—an observation captured in the subcategory Unlike rehabilitation at home. The intervention was more fitted and individualized, they noted, than the rehabilitative interventions at home. The subcategory The significance of the environment describes the respondents' experience of training in an environment that was different from where they received regular care at home. **My body and mind learn to know better** The respondents described changes in their body function and functional ability and also behavioural changes experienced throughout the ETT program. They noted changes in their mindset, the importance of learning more about stroke, and acknowledging and maintaining motivation in the rehabilitation process. The subcategory Perceived functional improvement

	describes the experience of increased functional capacity. The participants noted function improvements both in training settings and in daily life outside the rehabilitation context. The subcategory Experiences of insights and challenges throughout the program describes the experience of shaping new attitudes towards exercise, improvement, and knowledge. They noted the importance of knowing how and why the rehabilitation was done this way—elements they perceived as essential in motivating themselves to continue the high-intensity training. The participants expressed how tough it was to do exercises that were nearly impossible to accomplish. **The need and trust of others** The category Need and trust of others describes the importance of different external factors identified by the respondents for a successful rehabilitation. The category highlights the perceived importance of trust in rehabilitation clinicians and the support of family and other participants. To undertake the ETT program with the intense training included, they had to trust the competence of the rehabilitation staff, represented in the subcategory Trust in competence of physiotherapists and rehab personnel. The enthusiasm and positive attitude of the rehab staffs was described as important and motivating. During the rehabilitation period, strong connections developed between the group members. Meeting with others in the same situation was perceived as both inspiring and comforting, a sentiment captured in the subcategory The group as a source for motivation and cheerfulness. The group setting was noted as an important factor in self-motivation, and following the progress of others was both comforting and pleasing. The bonding between group members was evident. Another external factor identified by the respondents was The support from family and relatives. Many participants were accompanied by relatives, whose attendance was described as significant.
Limitations and applicability of evidence	Combining individuals with mild aphasia with those without aphasia, the study may have unintentionally stifled some of the participants' voices. Some of the discussions became somewhat incoherent; sometimes, when a participant stated something, another respondent would follow in a focus area unrelated to the first statement. However, all comments concerning the experience of ETT were included in the analysis.

	In addition, since all participants chose themselves to apply to the ETT program, and payment for the intervention differed (the Swedish social insurance system, employer, partly self-paid), the results might have been influenced by the participants' own expectations. The intervention was privately funded and therefore not greatly applicable to an NHS setting.

Study arms

Enriched task-specific therapy (ETT) post stroke (N = 20)
Focus group interviews were conducted with twenty participants with a mean time since stroke of 30 months and mean age 61 years, who completed the ETT program including task-specific training and environmental enrichment. ETT was delivered 3.5–6 h per day, 51=2 days per week for 3 weeks in a climate suitable for both indoor and outdoor activities. The training consisted of repetitive mass practice of gradually increasing difficulty. Directly after the intervention, qualitative interviews were conducted in six focus groups. The interviews were analysed with qualitative content analysis.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations

Walker, 2016

Bibliographic Reference	Walker, Johanne; Moore, Melanie; Adherence to modified constraint-induced movement therapy: the case for meaningful occupation; Journal of Primary Health Care; 2016; vol. 8 (no. 3); 263-266

Study details

Secondary publication of another included study- see primary study for details	NR
Other publications associated with this study included in review	NR
Aim	To explore the experience of two participants undergoing a mCIMT protocol and examine factors influencing adherence to the protocol.
Population	One participant was male (55 years) and the other female (69 years). Time post stroke was one year and four years, respectively. The male had experienced a left hemisphere stroke and the female a right hemisphere stroke, both resulting in upper limb motor impairment on the opposing side. Both were right dominant.
Setting	Australia - community setting.
Study design	A qualitative case study design was used. Two participants with upper limb hemiparesis following a stroke were recruited and received mCIMT (two hours of therapy, three days per week for a total of two weeks). During the treatment period, participants were also encouraged to wear the restraint mitt for four hours per day at home. Qualitative data were gained from the Canadian Occupational Performance Measure (COPM) 11 and semi-structured interviews, pre- and post-intervention and at 4 weeks
Methods and analysis	Three flexible, semi-structured interviews were conducted individually, providing data on the intervention experience and factors influencing adherence. Interviews targeted the following: intensity of protocol; perceived benefits and motivation patterns; and improvements made. Interviews were audio-recorded, transcribed, checked and themed.

Findings	**Frustration** Both participants experienced feelings of frustration during the mCIMT programme. They reported feeling frustrated and disheartened. The demands and rigor of CIMT or mCIMT can influence compliance negatively. In relation to client motivation and adherence to protocol, it highlights the importance of meaningful and psychologically rewarding occupations. when unsuccessfully attempting an activity with one hand and found task performance significantly slower when using the affected hand. This contributed to instances when both participants reported it was easier not to use the affected hand for certain activities and found it diminished their self-esteem regarding their independence and stage of recovery. **New way of thinking** During therapy, Participant 1 noted an increased awareness of using the affected hand in daily tasks, with a subsequent adjustment in the way he perceived task performance. This inspired him to try previously un-attempted activities, with a resultant increase in confidence in using the affected hand. Both participants mentioned how skills, learnt during mCIMT, were directly transferable to daily living and led to problem solving. **Support availability** Participant 2 reported changes in motivation and compliance when in the different therapy environments. With therapist support, she was significantly more engaged and able to persevere in using the affected hand. In contrast, during the home-based programme, she reported reverting to using both hands. **Meaningful occupations** Both participants indicated that meaningful occupations during therapy increased their motivation and adherence to the mCIMT protocol, where valued tasks facilitated fine and gross motor skills and provided opportunities for practise in using the affected hand. Both participants acknowledged that meaningful and intrinsically rewarding occupations related to

	agricultural equipment (Participant 1) or doing artwork (Participant 2) greatly motivated their efforts to persevere in using the affected hand.
Limitations and applicability of evidence	Only 2 participants were interviewed Community setting in Australia which is not fully applicable to NHS setting.

Study arms

people undergoing constraint-induced movement therapy (N = 2)
Two participants with upper limb hemiparesis following a stroke were recruited and received mCIMT (two hours of therapy, three days per week for a total of two weeks). During the treatment period, participants were also encouraged to wear the restraint mitt for four hours per day at home.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Withiel, 2020

Bibliographic Reference	Withiel, T. D.; Sharp, V. L.; Wong, D.; Ponsford, J. L.; Warren, N.; Stolwyk, R. J.; Understanding the experience of compensatory and restorative memory rehabilitation: A qualitative study of stroke survivors; Neuropsychological Rehabilitation; 2020; vol. 30 (no. 3); 503-522

Study details

Secondary publication of another included study- see primary study for details	RCT under review
Other publications associated with this study included in review	NR
Aim	This study aimed to explore and contrast the qualitative experiences of 20 stroke survivors who received six weeks' training in MSG (manualised memory skills group, n = 10) or individual-CCT (LumosityTM, n = 10)
Population	community dwelling people with history of a stroke at least 3 months previously with reported memory complaints. Exclusion criteria were: severe physical impairment preventing access to intervention, inadequate computer proficient limiting computer use, severe cognitive or communication deficits impacting engagement and a history of other neurological or psychiatric condition impacting cognition. (Mean age = 61.90, SD = 10.48, range: 34-77 years)
Setting	community setting in Australia
Study design	semi-structured interviews, data were collected and analysed thematically, adopting a critical realist approach.
Methods and analysis	Qualitative study as part of a mixed methods study involving an RCT comparing compensatory and restorative approaches to memory rehabilitation. MSG involved 2 hour weekly sessions for 6 weeks run by a neuropsychologist in a community neurology clinic.

	CCT involved home based memory training on a computer completing 13 games. participants were instructed to complete training 5 x per week for 6 weeks. semi structured interviews comprised of 6 open ended questions. Questions were asked in a premediated order and responses recorded. interviews were carried out in patients homes and took 30-45 minutes. Transcription of audio recording were completed the authors using NVivo software. An orthographic notation system outlined by Braun and Clarke was followed. An inductive thematic analysis approach was adopted.
Findings	Six themes were identified: (1) Facilitators and barriers to intervention engagement, (2) Improving knowledge and understanding, (3) Connecting with others, (4) Perception of the intervention, (5) Impact on everyday memory and (6) Impact on emotions and sense of purpose. **Facilitators and barriers to intervention engagement** A consistent barrier identified across groups was fatigue. However in the MSG group it did not prevent training completion but in the CCT group it did. **Improving knowledge and understanding** participants expressed how the interventions contributed to gaining knowledge through use of cognitive strategies to improve memory. Half of the CCt participants described spontaneously adopting strategies to improve their performance on training exercises. while MSG pts were taught these strategies as a positive means to aid memory the CCT pts viewed these as negative or cheating.

Connecting with others

this was unique to the MSG groups and encompassed feelings brought about by being with others during the intervention. the most reported experience was the opportunity to talk with similar others and to share knowledge and experience. pts spoke about how seeing other allowed them to compare their journey and achievements so far and many felt lucky compared to others.

Perception of the intervention

Most CCT participants described how computer training provided them with a goal and notes the positive automated feedback motivated them. Yet negative automated feedback was a source of frustration (ie receiving a lower score than previously). other individuals reported the games were repetitive or frustrating. MSG group pts reported only positive experiences mainly related to the variety of content.

Impact on everyday memory

pts reported noticeable improvement in their everyday memory which was more evidence in the CCT group and extended to improvements in attention. MSG pts empathised the everyday functional translation of memory skills.

Impact on emotions and sense of purpose

Both groups expressed enjoyment from participation but this was more commonly articulated in the MSG pts. training was described as providing a sense of purpose either to have an activity to fill time or too have a planned activity to get them out the house. all experiences were positive in the MSG group while some were negative in the CCT group with reports of frustration.

Limitations and applicability of evidence	participants in both groups recounted difficulty remembering specific details about the intervention. considering memory impairment was under investigation, the potential for memory failures us expected and highlights the need for timely completion of participant feedback. A specific group of adult stroke survivors were included who had the capacity and adequate computer proficiency to be considered for participation. therefore the transferability to a broader population is limited. Two participants withdrew from the CCT intervention while none withdrew from the MSG group. the reasons cited were due to frustration of performing the intervention.

Study arms

computer based versus manulised memory skills training (N = 20)
This study aimed to explore and contrast the qualitative experiences of 20 stroke survivors (Mage = 61.90, SD = 10.48, range: 34-77 years) who received six weeks' training in MSG (manualised memory skills group, n = 10) or individual-CCT (LumosityTM, n = 10). Using semi-structured interviews, data were collected and analysed thematically, adopting a critical realist approach.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Worrall, 2011

Bibliographic Reference	Worrall, Linda; Sherratt, Sue; Rogers, Penny; Howe, Tami; Hersh, Deborah; Ferguson, Alison; Davidson, Bronwyn; What people with aphasia want: Their goals according to the ICF; Aphasiology; 2011; vol. 25 (no. 3); 309-322

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
Aim	To gain an understanding of what people with aphasia want from aphasia services.
Population	Stroke survivors N=50 People with aphasia post-stroke recruited through an aphasia registry, in addition to community contacts in three Australian cities. Variation within the sample was sought for the characteristics of gender, age, time post-onset and aphasia severity. People with other severe communication important (e.g. speech disorders such as dysarthria, cognitive impairments, hearing or visual impairment) were excluded from the study and all participants had to be able to participate in an in-depth interview in English using speech, gesture, writing, pictures and/or drawings. Participant characteristics: Male:female = 24:26. Mean age: 63.9 (10.8) years. Duration of aphasia: 54.9 (43.6) months. Mean Western Aphasia Battery Aphasia Quotient: 69.6 (24.2).
Setting	People recruited through an aphasia registry, in addition to community contacts in three Australian cities.
Study design	Qualitative descriptive study involving semi-structured interviews. All interviews were conducted in the participants' homes by experienced speech pathologists trained in in-depth interviewing techniques with people with aphasia. Supporting conversation techniques were used to facilitate the interaction. Family members were interviewed separately, but at the

	request of the participant with aphasia, were often present at the interview. the interview schedule included the following topics: 1) their experiences of aphasia; 2) their rehabilitation goals and needs; 3) their aphasia rehabilitation and service experiences; 4) aphasia services they would have wanted. These topics were repeated for specified times after their stroke (e.g. when they first went home, when they had outpatient speech therapy, and at the time of the interview).
Methods and analysis	All interviews were video recorded using a Sony digital video camcorder and transcribed verbatim based on the transcription conventions of Poland (2001). Qualitative content analysis was conducted to identify codes for the participants' goals and those codes with similar content were then merged into superordinate goal categories. NVivo qualitative data analysis software and MS Word software programs were used to manage the data during analysis. Rigour was enhanced through peer checking and prolonged engagement with the participants. The goals of the subsample were classified according to the ICF using the method proposed by Cieza and colleagues (2002, 2005). In addition to this method, six guidelines were established to ease the process of linking items to the ICF, as well as to improve consistency between researchers prior to the reliability study taking place. To determine coding reliability, 30% of the sample was recoded 2-4 weeks after the original coding.
Findings	**Return to pre-stroke life** Most participants expressed their desire to be normal again and to escape their current situation and return home to the security of their old life. Their main priority was to be rid of the consequences of the stroke. For some, this dominated the early period but appeared to change as they had to accept the reality of chronic disability; for others, the goal of a return to normality persisted. **Communication** All participants with aphasia naturally spoke of the importance of recovering their communicative function. They described intense feelings of frustration, hopelessness, isolation and depression at not being able to talk. Many stressed that the aphasia was often of higher priority to them than their physical impairments, which contrasted with health care systems' focus on physical recovery. They spoke in a general sense about their desire for communicative function, as well as more specifically. They spoke about the range of their communicative needs as well as communication to express their opinions. They spoke about the need for communication rehabilitation to be connected to real life. Participants often mentioned specific words or names they wanted to say in real life. They also spoke about how communication gave them confidence.

Information

One of the most commonly reported goals was that of obtaining information. Several people reported that they were apparently not told by their therapists, particularly in the early weeks or months, of the term used to describe their communication difficulty, and if the word "aphasia" was mentioned, it was rarely explained clearly. Even if they were told, their perception was that they were not, a finding that has significant implications for clinicians. Participants wanted information about aphasia and stroke for themselves and their family. They also wanted information about their prognosis and what to expect at different stages of rehabilitation. On a practical level, they needed information about aphasia and stroke to access services and to explain their difficulties to friends or people in the community. In addition, having information allowed people to start taking control and to participate in decisions about their own therapy and their own rehabilitation. Some participants also wanted more information about their therapy.

Speech therapy and other health services

Most participants wanted speech therapy that met their needs at different stages of recovery, that was relevant to their life, that was more frequent, and that continued for longer. They wanted positive relationships and interactions with their speech therapists and other health service providers.

Control and independence

Goals in this category included wanting to get out of an institution to their home, or wanting to do things by or for themselves. Some expressed frustration at not being a part of the decision making in their care, seeking information from sources other than health professionals. Some took on home practice as a form of taking control and continued it for years after discharge.

Dignity and respect

Many people reported a feeling of being disempowered by their aphasia. They wanted respect, stating that they were competent people, despite their communication difficulties. They sought respect by highlighting their pre-morbid skills and accomplishments or the progress they had made.

Social, leisure and work

It was very common for people to have social goals, including to be able to converse with family, chat with friends, read a night time story to the grandchildren, and feel comfortable in a crowd. Social goals were characteristic of later stages of recovery, but were also featured throughout their rehabilitation. Social ease and acceptance were very important goals. People with aphasia were upset by boredom and isolation. Younger people with aphasia were particularly aware of the loss of work and career and often held deep, stroke desires to return to some employment. These people often became volunteers if they could not achieve their work goals.

Altruism and contribution to society

A few people spoke of goals related to improving the lives of others, including other people with aphasia. Some participants devoted time to helping speech pathology students by being available for clinical placements, some volunteered in groups, and some wanted to increase people's awareness of aphasia.

Physical function and health

For many interviewees, physical recovery and general health goals were closely woven into the success of other kinds of goals. Hence, although the interview focused on goals related to aphasia, participants spoke of their goals on a broader sense. Many knew it was their physical improvements that would determine whether or not they could manage at home,

	and this often dominated rehabilitation. Once home, people's goals often included physical health, going for walks, keeping fit, going to the gym, and managing their weight, diabetes or epilepsy.
Limitations and applicability of evidence	Limitations: None provided by the study. Applicability of evidence: Broadly applicable. Australian-based study that mentions that people wanted additional rehabilitation.

Study arms

Stroke survivors (N = 50)
People with aphasia post-stroke recruited through an aphasia registry, in addition to community contacts in three Australian cities. Variation within the sample was sought for the characteristics of gender, age, time post-onset and aphasia severity. People with other severe communication important (e.g. speech disorders such as dysarthria, cognitive impairments, hearing or visual impairment) were excluded from the study and all participants had to be able to participate in an in-depth interview in English using speech, gesture, writing, pictures and/or drawings.

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Wray, 2020

Bibliographic Reference	Wray, F.; Clarke, D.; Forster, A.; "Guiding them to take responsibility": exploring UK speech and language therapists' views of supporting self-management of aphasia; Aphasiology; 2020; vol. 34 (no. 4); 411-430

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
Aim	To explore UK speech and language therapists views of 'self-management' as an approach to stroke rehabilitation including its application in practice with stroke survivors with aphasia.
Population	Healthcare professionals (Speech and Language therapists) N=18 Speech and Language therapists recruited through five National Health Service (NHS) speech and language therapy services. Prior to recruitment, the first author attended a team meeting with each service to explain the study and answer any questions. Inclusion criteria required speech and language therapists to be employed as a therapist within a recruiting trust; have a caseload including adults with post-stroke communication difficulties (aphasia, dysarthria, apraxia of speech). Participant characteristics: NHS Banding: 5-7/8. Median = 6.

Setting	United Kingdom. Speech and Language Therapists from five NHS services. Two recruitment sites were based exclusively in a hospital setting and did not see people in the community. Hospital sites had both acute and rehabilitation-based inpatient wards which were staffed by members of the therapy team. One provided an inpatient, early supported discharge and community based speech language therapist services. One was a community rehabilitation team with therapists working as a part of a larger multidisciplinary stroke team. One was a standalone adult community speech and language therapy team responsible for stroke survivors with aphasia who were discharged from the local hospital. There was no early supported discharge services at this site at the time of interview.
Study design	After providing written informed consent, in-depth, semi-structured interviews were undertaken with eligible speech and language therapists. Informed by previous literature reviews, a topic guide was devised for the interviews which focussed upon four areas: 1) the needs of stroke survivors with communication difficulties, the challenges faced by this group and the additional support which may be needed; 2) the role of speech and language therapists in providing support to stroke survivors with communication difficulties (including stroke survivors with aphasia) and barriers to fulfilling the role; speech and language therapists understanding of self-management (in relation to stroke rehabilitation) and whether this approach was used in their own practice (including with stroke survivors with aphasia); the future of care for stroke survivors with communication difficulties, improvements to care and where and how support should be provided. The topic guide was not pilot tested, however, was refined on an ongoing basis. To explore speech and language therapist's own views of self-management, no additional information about self-management was given prior to or during the interviews. At the beginning of the interview, we reminded therapists that we were interested in communication difficulties which included aphasia, dysarthria or apraxia of speech. Where there was ambiguity during the interviews, we sought to clarify if therapists views were specific to a particular communication difficulty or if their views were applicable across communication difficulties. Recruitment continued until there was significant overlap in the codes generated and it was felt that there was sufficient data to meet the aims of the study. Interviews were undertaken in a quiet room at the service where therapists were based and took place between June 2016 and January 2017. Each participant was interviewed on one occasion by the first author alone (no other members of the research team were present). Interviews were audio recorded and digitally transcribed. Transcripts were not returned to participants for comment or correction. Once transcribed, pseudonyms were used to protect the anonymity of interviewees. References to people, places and NHS services were also anonymised. Fieldnotes were made during and immediately after the interviews detailing interruptions or distractions and impressions of the key topics discussed. Fieldnotes were stored as memos in NVivo and provided contextual data to inform the coding and interpretation of the transcripts.

Methods and analysis	Interview data were analysed using Thematic Analysis. In line with this approach, the analysis was conducted in six phases. Codes and themes were developed inductively from the data. Codes were grouped in to five labels and fifteen sub-labels prior to theme development: 1) meaning of self-management; 2) examples of practice; 3) organisational barriers to enabling self-management; individual factors influencing self-management; support for self-management following discharge. The process of analysis was non-linear and a considerable amount of back and forth between transcript data and theme organisation was undertaken before the themes were finalised. The process of analysis was non-linear and a considerable amount of back and forth between transcript data and theme organisation was undertaken before the themes were finalised. There was an active selection and extraction of data based on its relevance to the research question which included interpretation of the 'keyness' of themes in illuminating therapists views of self-management. In this paper, we focus upon data where views were reported to be related to stroke survivors with aphasia specifically or reported to be applicable across the different types of communication difficulties. The creation of themes was not necessarily dependent upon the prevalence or recurrence of a concept within the data but rather its ability to inform the research topic. In some cases, themes may be recurrent in the majority of participants experiences and in other cases less so but this is stated explicitly within the findings. Coding was undertaken on an ongoing basis. Coding analysis was primarily undertaken by the first author; however, the themes were also discussed with second and third authors and at a PhD group held within the Academic Unit. Findings were also presented back to participants locally at team meetings. Feedback from participants was not included formally in the process of analysis, however, meetings provided general confirmation of the relevance of the findings to participants' experiences.
Findings	**Understanding of 'self-management'** Speech and Language Therapists were asked directly about their understanding of 'self-management' during the interviews and their views about how this may apply to their practice. Many had not come across the term before, or if they had, it was not understood in a context related to stroke or speech and language rehabilitation. Although this term was unfamiliar, most therapists thought that enabling 'self-management' was an integral part of speech and language rehabilitation more generally. 'Self-management' was associated with efforts to reduce the impact of language and communication difficulties as far as possible by maximising language recovery and also by fostering confidence and longer-term independence. Some therapists also associated self-management with the 'handing over' of responsibility to the stroke survivor to manage their condition. Some described how this required a joint approach within the therapeutic relationship. The need to 'hand over' responsibility was most prominent in the experiences of community based speech and language therapists. Some hospital-based therapists suggested that the hospital environment may limit opportunities to promote self management. One

suggested there may be different stages of self-management with stroke survivors able to take more responsibility over time as their knowledge about their condition (and how best to manage it develops).

Therapists often exemplified their understanding of 'self-management' with illustrations from their own practice. Therapists gave a wide range of examples of how this term may be applied to their day-to-day work with stroke survivors with aphasia. Some associated self-management with completing impairment focused therapy tasks between sessions with minimal supervision. Others spoke about encouraging the practice of communication (or compensatory strategies) outside of session time. Goal setting was also related to promoting self-management by facilitating a sense of ownership and control within therapy. Lastly, the involvement of family members was a common interpretation of the application of self-management in practice. Therapists reported that families could be involved in three ways; firstly, by supporting the stroke survivor with aphasia to complete therapy tasks between sessions; secondly, by facilitating the integration of communication strategies learnt in speech and language therapy to daily life and; thirdly, by taking on board strategies to support their family member's communication. Speech and language therapists highlighted family involvement as being particularly important in cases where severe aphasia or cognitive difficulties presented an additional barrier to engagement in therapy. In this case therapists work became focussed upon altering the environment to benefit the stroke survivor's quality of life. In this context 'self' management was extended to encompass supporting the family to support the person.

Barriers to enabling self-management

Lack of resources for speech and language therapy in the community setting

In the community setting, therapists identified constraints on the number of sessions they were able to offer as a barrier to supporting people to manage in the longer-term. Therapists described how limited time impacted delivery of therapy which was perceived to be important in relation to self-management. Building confidence in communication was perceived to be an important role in relation to self-management. One aspect of building confidence was practicing in real life situations, for example, going to a coffee shop or on the bus with a stroke survivor in order to practice communication itself or the use of alternative strategies. However, this was not always possible as a part of therapy. However, it is important to note that

some services did have the time and flexibility to deliver this kind of approach. However, limited resources were a clear source of frustration for many therapists who described feeling restricted in the level of support they could offer.

Stroke survivors 'readiness' to engage in self-management

In addition to resource limitations, therapists also identified individual characteristics which influenced engagement with aspects of therapy perceived to facilitate self-management. Therapists in hospital and community settings reported that stroke was a sudden, shocking and life-changing event and this necessitated psychological adjustment or the stroke survivor 'coming to terms' with the sudden loss of speech and language which had previously been taken for granted. However, difficulties arose when a lack of adjustment affected the stroke survivor's ability to engage in therapy. Struggle to adjust were often associated with stroke survivors having unrealistic expectations of recovery and the role therapy could play in recovery. Therapists reported that a common perception was that the stroke survivor expected to regain 'normal' speech and language following therapy or that therapy would 'fix' their communication. In this circumstance, therapists suggested that some acceptance of living long-term with communication disability was needed in order for people to utilise strategies which might aid their transition to longer-term adaptation, adjustment and self-management.

Difficulties with psychological adjustment (or acceptance) were often perceived to be related to low mood and lack of motivation. These factors were again highlighted by therapists as those which influenced stroke survivors' ability to engage with strategies which might enable longer-term condition management. Within hospital and community settings, therapists reported managing difficulties with low mood and motivation as well as they could with the skills they possessed. However, some therapists identified a training need to feel better equipped to have conversations with stroke survivors about psychological problems.

Difficulties involving family members in rehabilitation

Therapists highlighted the important role family members could play in supporting self-management. Although benefits of involving family members were recognised, barriers to involving family members were also reported. Practical barriers identified included whether or not the family member was available to be involved in the therapy session. Some suggested

that some family members may have certain expectations about the role of the therapist that influences their level of involvement. Family members' expectations about their involvement were also reported to be related to 'readiness' to accept the potentially longer-term implications of living with aphasia.

Lack of availability of other services to support self-management

Therapists identified the limitations of community services in terms of the amount of therapy which could be offered with the resources available. In this respect, the therapy offered by therapists was perceived to be one aspect of the support needed to enable and sustain self-management. However, difficulties were also identified in accessing further support to stroke survivors and their family members following discharge from services. Further support was often described by therapists to be needed to address the longer-term, psychosocial implications of living with communication difficulty. This generally focused upon being supported to apply the skills which had been learned in therapy to everyday and personally meaningful situations. At the time of the interviews, therapists reported that the majority of support available to stroke survivors post-discharge was in the form of peer support groups run by charitable organisations. Support groups were either specific aphasia groups or general groups for all stroke survivors. The perceived benefits of support groups were that they gave stroke survivors an opportunity to practice their communication and meet others in a similar position. However, therapists identified a number of barriers to attending support groups including transport (either arranging transport or the financial cost of transport), mobility problems and the need for toileting assistance which could not be provided at the group. Other barriers to attending groups included personality factors (not being a 'group person'), a lack of confidence, and younger stroke survivors feeling as though they did not fit in at groups with stroke survivors who were older than them.

Due to charities changing provision, therapists were often uncertain about what they were offering or perceived that the support they could offer had reduced. Therapists perceived that longer-term support was often necessary but expressed a number of barriers to the stroke survivor accessing services to meet their needs. Some therapists suggested that those who lived alone or lacked social support were in particular need of ongoing support. Difficulties were also identified by therapists in accessing specialist psychological support across the care pathway. The lack of availability of timely, accessible and appropriate psychological services for stroke survivors was a clear source of frustration for many therapists. At each of the participating sites, therapists described a lack of specialist input from psychologists. None of the sites had dedicated input from a clinical or neuropsychologist and many described lengthy waiting lists to access such services. Barriers were also

	reported to accessing Increasing Access to Psychological Therapy services in the community setting; with the criteria for such precluding referral of a stroke survivor with moderate to severe aphasia.
Limitations and applicability of evidence	Limitations: The therapists were from one geographical region in the UK and so their practices, views and experiences may not be representative of other services across the country or speech and language therapy provision in other countries. Similarly, those who chose to participate in the study may have had different practices, views or experiences to those who did not. The interview guide was general in regards to communication difficulties and had it focussed on people with aphasia the results may have been different. They did not collect information about therapists' years of experience working with stroke survivors.

Study arms

Healthcare professionals (Speech and Language therapists) (N = 18)
Speech and Language therapists recruited through five National Health Service (NHS) speech and language therapy services. Prior to recruitment, the first author attended a team meeting with each service to explain the study and answer any questions. Inclusion criteria required speech and language therapists to be employed as a therapist within a recruiting trust; have a caseload including adults with post-stroke communication difficulties (aphasia, dysarthria, apraxia of speech).

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Moderate limitations

Young, 2013

Bibliographic Reference	Young, A.; Gomersall, T.; Bowen, A.; investigators, A. C. T. NoW; Trial participants' experiences of early enhanced speech and language therapy after stroke compared with employed visitor support: a qualitative study nested within a randomized controlled trial; Clinical Rehabilitation; 2013; vol. 27 (no. 2); 174-82

Study details

Secondary publication of another included study- see primary study for details	ACT NoW study RCT part of mixed methods trial
Other publications associated with this study included in review	NR
Aim	•To explore participants' experiences of speech and language therapy intervention or visitor attention control; contact with any non-professional can have beneficial effects for someone with aphasia or dysarthria in the early weeks following a stroke. The study points to specific conditions that would have to be met for contact to have a positive effect. • to evaluate from participants' perspectives the effectiveness of speech and language therapy intervention or visitor attention control, both in terms of process and outcome; • to compare the perceived impact on participant well-being of speech and language therapy intervention or visitor attention control.
Population	22 people who, after stroke, had a diagnosis of aphasia (12), dysarthria (5) or both (5) and who participated in the ACT NoW study. All participants in the ACT NoW study who had completed their post-outcome (six month) assessment between June 2008 and April 2009 were approached. ACT NoW exclusion criteria meant that there were no potential participants with pre-existing learning disabilities or dementia likely to prevent benefits from therapy, subarachnoid haemorrhage,

	serious medical conditions (e.g. terminal disease), unable to complete eligibility screening even after three attempts or, with communication problems that had already resolved. There were 13 men and 9 women in the sample with a median age of 73 years (range: 53–98 years). Five had a diagnosis of dysarthria, 12 of aphasia and 5 had both aphasia and dysarthria.
Setting	Eight English NHS usual care settings.
Study design	Qualitative study nested within a randomized controlled trial.
Methods and analysis	Individual interviews. The potential involvement of participants with the greatest difficulty communicating was maximised by training the interviewer in the techniques of Supported Conversation for adults with Aphasia and through the design of the interview. The interview method incorporated prompt cards for expressions, pictorial representations of activities and visual analogue scales to represent degrees of emotion or opinion. These communication ramps could be used in different ways depending on the individual's degree and kind of communication difficulty. They could be ignored, or used simply as an aide-memoire to remain focused on the topic of discussion. They might replace specific words/ expressions that the participant was unable to articulate, or pointing to them combined with gesture might be used to convey meaning. What was important was that the form of the interview and the means of the interview were maximally flexible to encourage participation from people with different communication needs and strengths. The interview schedule was divided into three sections: (1) questions that invited a discussion of what had taken place during their contact with the speech and language therapist or visitor (description); (2) questions that encouraged participants to explore what they thought about the contact with speech and language therapist or visitor (appraisal); (3) and questions that invited participants to judge the impact of their experience on themselves or others (evaluation). All interviews were video recorded to capture verbal and non-verbal expression. Thematic content analysis assisted by a bespoke data transformation protocol for incorporating non-verbal and semantically ambiguous data. The trial developed a data transformation protocol to manage data where conventional transcription was not possible. It was guided by three principles: (a) a respect for participants' efforts to ensure that their opinions were recorded, by whatever media of communication they could use; (b) a concern not to over-interpret data where the meaning was not clear; (c) to develop a process that had the potential to address the three levels of meaning sought in the data collection: description, appraisal and evaluation.

Findings	**Mood** Participants identified the positive effect on their mood of their speech and language therapy or visitor experiences as a key marker of effectiveness. This positive impact could occur either as a result of contact with someone who was friendly and supportive serving to lift them out of a low mood, or because such contact could distract them from the difficulties of living with the consequences of stroke. The professional identity or role of the individual speech and language therapist or visitor was of far less importance than their personal qualities in generating such positive effects. Participants identified five helpful characteristics for positive interactions during contact: • the ability to put someone at ease; • the ability to make an individual feel important; • the visitor/speech and language therapist displaying a positive mood themselves; • being empathic; • being a good communicator. **Confidence** Both speech and language therapy and visitor experiences were viewed by participants as helping to enhance personal confidence but differences in the process of care were observed. Those with visitor experience described enhanced confidence in terms of the normalizing effects of regular contact with a stranger. Visits meant they had to engage in social interaction and face their concerns about communicating with someone who did not know them well. **Recognising progress** Participants strongly emphasized the importance of being able to recognize their own progress. The extent of improvement was often of less importance than the sense of moving forward. There was a difference in how speech and language therapy or visitor contact was seen as contributing to the observation of progress. Those with therapy experience described how the therapist might deliberately point out their areas of weakness or skills they needed to develop/re-learn in a targeted way. Before and after measures of how well they were doing were also built in.

Meeting individual needs.

Participants highly valued speech and language therapists or visitors who could make their interaction seem specifically relevant to the individual. The most effective examples of encounters were ones that felt tailored to who the participants were, not just what their clinical problem might be.

Guidance and support

Participants gave very different descriptions of the kind of guidance and support they had received from speech and language therapists or visitors. Visitors were trained not to engage in deliberate strategies of therapeutic activity. The fact that participants did not perceive them to be doing so is important for evidencing the fidelity of the attention control within the trial design. By contrast, participants strongly perceived the purposefulness and structure of speech and language therapy, referring to ‘building blocks’, ‘strategies’ and ‘deliberate learning’ that was not evident in the data from those with visitor experience. However, unique to descriptions of the visitor experience was the value participants placed on being able to give to the visitor, usually in relation to knowledge and know how. The reciprocity was regarded as therapeutic.

Amount and intensity

Participants valued a high amount of contact, whether with speech and language therapists or visitors. High amount of contact was defined by frequency, number and length of visits and/or amount of time spent with them. Furthermore, the amount of support was perceived to be closely connected with the benefit. More contact felt like more benefit in quite a straightforward equation for the majority of participants. Some participants also discussed the importance of frequency of contact being tempered with sensitivity to meeting the particular needs which participants were experiencing at any given time. Part of this sensitivity was about flexibility and awareness of how easy it might be to feel overloaded which could undermine the benefits of a large amount of contact. This was true both among those who had speech and language therapy and those who had a visitor. No concerns were expressed that the large amount of contact had come too early in their recovery process.

Limitations and applicability of evidence	The main weakness of this study is the small numbers available to participate which precluded a purposive approach to sampling. The strongly positive data about early and sustained contact might be biased by nature of the sample. It is unknown whether those who chose not to participate had more negative views and therefore were less inclined to make the further commitment to be interviewed. The study is also limited by the fact that only service users were interviewed. There is no parallel qualitative data from the speech and language therapists or visitors involved. Although care was taken to ensure that the qualitative analysis was undertaken independent of and prior to the analysis of the randomized controlled trial, influences between the two parts of the study will inevitably have occurred within a common ACT NoW team. The study took place in an NHS setting in England so the setting is very applicable. However there was no direct comparison of different intensities.

Study arms

ACT NoW post stroke patients (N = 22)
Twenty-two people who, after stroke, had a diagnosis of aphasia (12), dysarthria (5) or both (5) and who participated in the ACT NoW study

Critical appraisal - CASP Qualitative Checklist (3.1 Intensity of rehabilitation)

Section	Question	Answer
Overall	Overall quality assessment	Minor limitations